

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

JUNE 23RD, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors :—

FOR THE LIBRARY.

From LORD ARTHUR RUSSELL, M.P.—Correspondence relating to the Native Population of Fiji.

From the UNITED STATES GEOLOGICAL SURVEY.—The Copper-Bearing Rocks of Lake Superior. By Roland Duer Irving.

From the AUTHOR.—*Les Derniers Voyages des Néerlandais à la Nouvelle-Guinée.* By Prince Roland Bonaparte.

— *Les Récents Voyages des Néerlandais à la Nouvelle-Guinée.* By Prince Roland Bonaparte.

— Remarks upon Chipped Stone Implements. By F. W. Putnam.

— The First Notice of the Pine Grove or Forest River Shell-heap. By F. W. Putnam.

— *Les Primitifs.* By Elie Reclus.

— The Iroquois Book of Rites. By Horatio Hale, M.A.

From the ACADEMY.—*Atti della Reale Accademia dei Lincei. Serie Quarta. Vol. I, Fas. 12.*

— *Boletin de la Accademia Nacional de Ciencias en Cordoba. Tomo VII, Entrega 4.*

From the INSTITUTION.—Journal of the Royal United Service Institution. No. 129.

VOL. XV.

T

From the SOCIETY.—Transactions of the Geological Society of Glasgow. Vol. VII, Part 2.

— Journal of the Society of Arts. Nos 1699, 1700.

— VI-VII. Jahresbericht des Vereins für Erdkunde zu Metz für 1883-1884.

From the EDITOR.—The American Antiquarian. Vol. VII, No. 3.

— L'Homme. 1884. No. 11.

— Matériaux pour l'Histoire de l'Homme. June, 1885.

— The Museum. Vol. I, No. 2.

— "Nature." Nos. 815, 816.

— "Science." Nos. 121, 122.

The election of the following new Members was announced:—

LADY BRASSEY; Dr. ROBERT BROWN, M.A.; Colonel T. CADELL, V.C.; C. HEAPE, Esq.; H. H. JOHNSTON, Esq.; D. MACRITCHIE, Esq.; Professor H. N. MOSELEY, F.R.S.; MISS NORTH; and C. SEIDLER, Esq.

LADY BRASSEY exhibited a large collection of objects of ethnological interest from Polynesia.

MISS NORTH exhibited several ethnological specimens from New Ireland.

MR. CARL LUMHOLTZ exhibited a series of Australian implements.

The following paper was read by the author, and illustrated by an exhibition of objects made by the Solomon Islanders:—

On the PHYSICAL CHARACTERS of the SOLOMON ISLANDERS. By H. B. GUPPY, M.B., F.G.S., late Surgeon of H.M.S. "Lark."

THESE observations, which were made between 1881 and 1884, were confined for the most part to the natives of the opposite extremities of the group, at the eastern extremity to the natives of St. Christoval and of the adjoining small islands of Ugi, Santa Anna, and Santa Catalina, and towards the opposite extremity to the natives of the islands of Bougainville Straits, which include Treasury Island, the Shortland Islands, Faro Island, together with Choiseul Bay. Observations, although fewer in number, were also made on the natives of the following intermediate islands, viz., Malayta, the Florida Islands, and Simbo or Eddystone Island.

All the measurements, unless otherwise stated, refer to male adults: and with these preliminary remarks, I will at once proceed to describe the physical characters in their order.

Stature.

Height in feet and inches.	Number of Measurements.
4 feet 11½ inches to 5 feet 0 inches.	2
5 " 0 " 5 " 1 "	5
5 " 1 " 5 " 2 "	6
5 " 2 " 5 " 3 "	13
5 " 3 " 5 " 4 "	18
5 " 4 " 5 " 5 "	9
5 " 5 " 5 " 6 "	10
5 " 6 " 5 " 7 "	6
5 " 7 " 5 " 8 "	2
5 " 8 " 5 " 8½ "	1
Total	72

The foregoing table includes all the measurements of height which I obtained in the various parts of the group. The range of these 72 measurements is 4 feet 11½ inches to 5 feet 8½ inches. Fifty of these are gathered together between 5 feet 2 inches and 5 feet 6 inches. Arranging the whole series in order I find that the value of the central number (36th) is 5 feet 4 inches; of the quarter-points, the value of the 18th is 5 feet 3 inches and of the 54th 5 feet 5½ inches; and the values of the 9th and 63rd in the scale are 5 feet 1½ inches and 5 feet 6 inches respectively. There is a disturbing element in this series, which is probably the result of combining in the same series the natives of the Bougainville Straits islands and those of St. Christoval, the latter being rather shorter as noticed below. We may, however, take the value of the median as representing the average height of a native of the Solomon Islands, viz., 5 feet 4 inches or 1.625 mètres, which is somewhat below the medium height of the human race as stated by Topinard at 1.65 mètres. It is however, in a marked degree in excess of the height which Mayer gives for the Papuans, viz., 1.536 mètres (*vide* Topinard's "Anthropology").

Deviations of a constant character are found in different parts of the group, and often in different districts of the same island. The natives of the islands of Bougainville Straits, for instance, are noticeably taller than those of St. Christoval at the opposite end of the group, the averages of about thirty measurements in each region differing by from one-half to three-quarters of an inch. This difference in height in these two localities is accompanied by other important changes in the physical characters which will be subsequently referred to.

The range of my measurements may be contrasted with those

obtained by Miklukho-Maclay on the coast of New Guinea (*vide* "Nature," December 7th, 1882).

Papua-Koviny coast	..	..	..	1.75 to 1.48 mètres.
Maclay coast	..	..	..	1.74 „ 1.42 „
Solomon Islands	..	..	..	1.74 „ 1.51 „

Chest-Girth.

The range of the eighteen measurements given in the sub-joined table is $31\frac{1}{2}$ to 37 inches: and since half of these are included between 34 and 35 inches, we may consider these as the limits of the average chest-girth of the natives in the portions of the group in which the measurements were made, viz., the islands of Bougainville Straits, and St. Christoval with its adjoining islands.

Girth in inches.	Number of Measurements.	Stature taken as 100.
$31\frac{1}{2}$ to 32	1	50 .. 1
32 „ 33	3	52-53 .. 3
33 „ 34	3	53-54 .. 7
34 „ 35	9	54-55 .. 3
35 „ 36	0	55-56 .. 2
36 „ 37	2	56-57 .. 1
	—	57.2 .. 1
	Total 18	Total .. 18

Taking the average height 5 feet 4 inches as 100, the proportion which a chest-girth of $34\frac{1}{2}$ inches would bear would be 53.9. This very closely corresponds with the values of the median of the accompanying series, which itself agrees with the value of the average of the indices. This index of chest-girth may be compared with results given by Topinard:

Englishmen	..	..	..	..	..	54.0
Negroes	..	..	..	..	..	52.3
New Zealanders	..	..	..	..	..	51.4
Solomon Islanders	..	..	..	..	..	53.9

Weight of Body.

Twelve natives of the Shortland Islands were taken promiscuously and weighed, the following being the results stated in lbs.:—100, 103, 116, 117, 120, 120, 123, 130, 148, 148, 150, 154. The mean of these numbers is 127; and the average weight would probably vary between 125 and 130 lbs., or between 57 and 59 kilogrammes. This probable average weight is quite in accordance with the size and build of a typical Solomon Island native, and agrees with the general rule that the

weight in lbs. ought to be about twice the height in inches; the average height being 64 inches, and the average weight 125 to 130 lbs.

Length of Limbs.

The points of measurement employed were—

- (a) *For the upper extremity:* (1) a point half an inch outside and on a level with the apex of the coracoid process of the scapula; (2) the centre of the hollow of the elbow on a line drawn from the interspace between the head of the radius and the external condyle of the humerus (indicated by a dimple when the forearm is extended) to immediately below the internal condyle; (3) the centre of a line joining the apices of the styloid processes of the radius and ulna on the front of the wrist.
- (b) *For the lower extremity:* (1) a point on the middle of the front of the thigh on a level with another point midway between the anterior superior spinous process of the ilium and the upper edge of the great trochanter; (2) a point on the "ligamentum patellæ" on a level with the upper edge of the external tuberosity of the tibia; (3) the centre of the front of the ankle on a level with the base of the internal malleolus.

1. *The intermembral index*, or the ratio between the lengths of the upper and lower limbs, taking the latter as 100. From the table subjoined it will be seen that the range of 26 indices is 64 to 73. Eleven of these lie between 67 and 68; and since the average of my numbers, which is 68, corresponds with the value of the median of the series, we will take this index of 68 as representing the average ratio of the lengths of the two limbs compared together.

Intermembral Index.	Number of Measurements.	Intermembral Index.	Number of Measurements.
64	1	69	3
65	2	70	1
66	3	71	3
67	6	72	1
68	5	73	1
			Total 26

2. *The index of the forearm and arm*, or the ratio between the lengths of the forearm and arm, taking the latter as 100. The range of 27 indices is 79 to 100. Of these, 16 are included between 87 and 91, and the average of the numbers is 88.

Indices.	Number of Measurements.	Indices.	Number of Measurements.
79	1	87	6
80	1	88	2
82	2	89	1
83	2	91	7
84	1	95	1
86	1	100	2
			—
			Total 27

3. *The index of the leg and thigh*, or the ratio between the lengths of the leg and thigh, taking the latter as 100. The range of 27 indices, as shown in the subjoined table, is 68 to 97. Of these two-thirds are included between 74 and 83: and since the value of the median, which is 80, corresponds nearly with the average of the numbers, we may take it as representing the average proportion which the leg bears to the thigh amongst these natives.

Indices.	Number of Measurements.	Indices.	Number of Measurements.
68	1	80	3
69	1	81	2
70	1	82	2
72	1	83	4
73	1	88	3
74	2	92	1
75	2	97	1
78	1		—
79	1		Total 27

4. *The index of the arm and thigh*, or the ratio between the lengths of the arm and thigh, taking the latter as 100. The range of 27 indices is 56 to 73. Of these three-fourths are grouped between 61 and 69. The average of the figures is 65, and the median of the series is 66.

Indices.	Number of measurements.	Indices.	Number of Measurements.
56	1	66	3
57	1	67	4
60	1	69	3
61	2	70	1
62	2	71	1
63	3	73	2
64	2		—
65	1		Total 27

5. *The proportion of the length of the upper limb to the height of the body, taking the latter as 100.*

Indices.	Number of Measurements.
32	1
32-33	10
33-34	10
34-35	4
35-36	2
	<hr/>
	Total 27

These 27 indices range between 32 and 36; three-fourths of them are included between 32 and 34. Since the average of the numbers, which is 33·3, nearly corresponds with the value of the median, we may take it as representing the proportion which the length of the upper limb bears to the height of the body amongst these natives.

6. *The proportion of the length of the lower limb to the height of the body, taking the latter as 100.* The range of these 27 indices is 46·9 to 51·6. Two-thirds of the total number are included between 48 and 50; and since the average of the numbers, which is 49·1, corresponds nearly with the value of the middle index of the series, we may take it as representing the proportion that the lower limb usually bears to the height of the body amongst these natives.

Indices.	Number of Measurements.
46·9	1
47-48	4
48-49	8
49-50	10
50-51	3
51·6	1
	<hr/>
	Total 27

7. *The span of the outstretched arms.*—The following indices, 69 in all, show the ratio of the span of the arms to the height of the body, taking the latter as 100 :—

Indices.	Number of Measurements.	Indices.	Number of Measurements.
100	1	107-108	11
101-102	4	108-109	6
102-103	2	109-110	9
103-104	4	110-111	3
104-105	5	112·6	1
105-106	5		—
106-107	18		Total 69

The range of these indices is 100 to 112·6 ; and the indices of greatest frequency are those included between 106 and 107. Placing all the indices in their order, I find that the value of the central of the series is 106·7, and of the quarter-points 105·2 and 108·6 respectively. Taking 106·7 as representing the average proportion which the span of the arms bears to the stature amongst these natives, I may compare it with similar results given for other races in Topinard's "Anthropology."

American soldiers (10,876)	=	104·3
Solomon Islanders (69) ..	=	106·7
Negroes (2,020)	=	108·1

8. *Distance of the tip of the middle finger from the upper edge of the patella.*

Distance.	Number of Measurements.
2 inches.	2
2 to 3 "	6
3 " 4 "	11 (9 of these at 3½ inches).
4 " 5 "	2
	—
	Total 21

From this table it will be seen that amongst twenty-one natives the tip of the finger never approached the patella nearer than 2 inches, and was never farther removed than 5 inches. The value of greatest frequency is 3½ inches, and it may be taken as approximating the average distance. Comparing it with the average stature (64 inches) taken as 100, we obtain the index 5·46.

By comparing the distance of the middle finger above the patella with the stature as 100 in each individual measurement, we obtain a more reliable average index somewhat smaller than the preceding.

Indices.	Number.
3·12-4·00	4
4·00-5·00	5
5·00-6·00	9
6·00-7·00	1
7·00-7·94	2
	Total 21

In this table the indices range between 3·12 and 7·94; nearly half are included between 5·00 and 6·00; the value of the median is 5·24, and the average of the numbers is 5·19. Accepting the value of the median as our average index for these natives, it may be compared with similar results for other races given in Topinard's "Anthropology."

American soldiers (10,876) = 7·49.
 Negroes (2,020) .. = 4·37.
 Solomon Islanders (21) .. = 5·24.

I will conclude my remarks on the length of the limbs by giving from the preceding data, the limb measurements of a Solomon Island native of average height.

Intermembral index, 68.	Height of body ..	= 64 inches	} Index of height, and length of upper limb, 33·3.
	Length of upper limb =	21½ "	
	" arm ..	= 11½ "	} Index of arm and forearm, 88.
	" fore-arm =	10 "	
	" lower limb =	31½ "	} Index of height, and length of lower limb, 49.
	" thigh ..	= 17½ "	
	" leg ..	= 14 "	} Index of thigh and leg, 80.

The form of the skull, as indicated by the relation to each other of its length and breadth.—In the following table are arranged the cephalic indices obtained from the measurement of 100 individuals belonging to various parts of the group, viz., St. Christoval and its adjoining small islands of Ugi, Santa Anna, and Santa Catalina; Malayta; the Florida Islands; Simbo or Eddystone Island; and the islands of Bougainville Straits, which include Treasury Island, the Shortland Islands, Faro Island, and the adjoining west end of Choiseul. The bulk of the observations, however, were made amongst the islands of Bougainville Straits, and in the island of St. Christoval and its adjacent smaller islands, localities which lie at opposite extremities of the group.

In this series, which ranges from 69·2 to 86·2, there is a want of uniformity arising from the fact that the numbers tend to gather around three centres, one between the indices 75 and 76,

another between the indices 80 and 81, and the third between the indices 82 and 83. We have thus in this series of a hundred indices, obtained by measurement of the head of the living subject, evidence of different prevailing types of skull amongst the natives of the Solomon group; and it will be subsequently shown that each locality has usually one prevailing type.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
69·2 to 70	2	78 to 79	11
70 " 71	1	79 " 80	12
72 " 73	3	80 " 81	16
73 " 74	3	81 " 82	7
74 " 75	6	82 " 83	10
75 " 76	8	83 " 84	7
76 " 77	6	85 " 86	1
77 " 78	6	86 " 86·2	1
		Total 100	

1. *St. Christoval and the adjoining islands of Ugi, Santa Anna, and Santa Catalina.*—As shown in the subjoined table, this series of 35 indices has a wide range between 69·2 and 86·2. The value of the median index of the series is 75·9; and the average of the numbers is 76·6. Out of the 35 indices, 11 are included between 74 and 76. On the whole, however, I should take 76 as representing the average cephalic index in this part of the group, although even here, as shown in the series, there is some disturbing element.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
69·2 to 70	2	77 to 78	2
70 " 71	1	78 " 79	4
72 " 73	2	79 " 80	3
73 " 74	2	80 " 81	1
74 " 75	6	82 " 83	2
75 " 76	5	83 " 84	1
76 " 77	3	86 " 86·2	1
		Total 35	

2. *The islands of Bougainville Straits*, which include Treasury Island, the Shortland Islands, Faro Island, and the western extremity of Choiseul.

The range of the subjoined 40 indices is 75·9 to 85·2. The contrast between this and the preceding *St. Christoval* series, as shown in the grouping of the indices, well illustrates the

prevalence of distinct types in these two regions of the group. The indices of greatest frequency are included between 80 and 81; the average of the figures is 80·6, and the value of the typical median index is 80·7, which may be accepted as the index.

Cephalic Indices.	Number of Measurements.	Cephalic Indices.	Number of Measurements.
75·9 to 76	2	80 to 81	9
76 " 77	1	81 " 82	5
77 " 78	2	82 " 83	5
78 " 79	6	83 " 84	6
79 " 80	3	85 " 85·2	1
		Total	40

3. *The north coast of Malayta.*—Through the kindness of the Hon. Curzon Howe, Government Agent of the labour-schooner "Lavina," I was enabled to measure ten natives who had been recruited from the districts of Urasi and the Uta Pass on the north coast of Malayta.

Cephalic Indices.	Number of Measurements.
79·3 to 80	2
80 " 81	4
81 " 82	1
82 " 83	3
Total	10

This series, although small, is compact, its range being 79·3 to 83. The average of the numbers is 81·2, which I will take as typical of these localities.

4. *The island of Simbo or Eddystone.*—From the head-measurements of nine natives I obtained the following cephalic indices :—72·9, 73·8, 75·8, 76·6, 77·0, 78·0, 78·7, 79·3, 80·4, the average of which just falls short of 77, which, however, may be taken as an approximation of the prevailing index.

5. *The Florida Islands.*—Measurements of six natives of Mboli Harbour gave the following cephalic indices :—77·2, 79·3, 79·3, 80·0, 80·7, 81·4, the average of the numbers being 79·6.

I will now proceed to sum up briefly the results of the foregoing hundred measurements of the head of the living subject. It will first be necessary to reduce them to the form of measurements of the actual skull by subtracting two units from the

index as proposed by M. Broca. The effect of this correction is shown in the following table:—

		Number of Measurements.	Living subject.	Skull.
St. Christoval and adjoining islands	..	35	76·0	74·0
The Islands of Bougainville Straits	..	40	80·7	78·7
The north coast of Malayta..	..	10	81·2	79·2
The Island of Simbo or Eddystone..	..	9	77·0	75·0
The Florida Islands .. .. .	..	6	79·6	77·6

Accepting all indices below 75 as dolichocephalic, those between 75 and 80 as mesocephalic, and those above 80 as brachycephalic, we find, therefore, that mesocephaly, as represented by an average index of 78·7, prevails amongst the natives of the islands of Bougainville Straits; whilst dolichocephaly, as represented by an average index of 74, prevails amongst the natives of St. Christoval and its adjoining islands at the opposite end of the group. On the north coast of Malayta exists a type of native with an almost brachycephalic index. The foregoing remarks refer only to the average in each locality. When we apply the same correction to the table of the hundred measurements as given on page 274, we find that—

29 are dolichocephalic.
52 „ mesocephalic.
19 „ brachycephalic.

100

It is clear, therefore, that brachycephaly is not uncommon amongst the natives of these particular islands. Dolichocephaly is, however, more frequent. But mesocephaly prevails. Future observers must decide whether it prevails through the whole group.

As confirmatory of the foregoing corrected measurements of the head of the living subject, I will add the indices of nine skulls, mostly female, procured amongst the eastern islanders of the group.

74·1 } Rua Sura Islets off north coast of Guadalcanar.
74·1 }
74·1 Ugi Island.
74·5 Port Adam, Malayta.
75·5 }
75·9 } Ugi Island.
80·0 }
80·0 }
84·9 Kwahkwahru, Malayta.

The Features.

The facial angle taken was that between a line dropped from the forehead to the alveolar border of the upper jaw, and another line drawn from the external auditory meatus through the central axis of the orbit, the angle being taken with a goniometer. Amongst eighty natives from different parts of the group, the angle varied between 87° and 98° . Seventy-five of the natives had facial angles between 90° and 95° , and the average of the whole number of angles was 93° . On applying the method for obtaining the facial angle of Cloquet to two large photographs of the faces in profile of two typical natives, I find the angles to be 63° and 67° respectively.

The common characters of the features may be thus described:—face rather angular, with often a beetle-browed aspect from the deeply sunk orbits and projecting brows; forehead of moderate height and breadth, and somewhat flattened; middle of face rather prominent on account of the chin receding; moderate subnasal prognathism as indicated by Cloquet's facial angles of 63° and 67° ; lips rather thick and often projecting; nose usually coarse, short, straight, and much depressed at the root, with broad nostrils and extended alæ; in about one man out of five the nose is arched in a regular curve, giving a Jewish cast to the face.

The Hair.

Amongst the natives of the Solomon group there are four common styles of wearing the hair, which I may term the woolly, the mop-like, the partially bushy, and the completely bushy; these prevail with both sexes, the fashion varying in different islands. From frequent observation of the different modes of wearing the hair, I am of the opinion that their variety is to be attributed more to individual fancy than to any difference in the character of the hair. According to his taste, a man may prefer to wear his hair close and uncombed, when the short matted curls with small spiral give it a woolly appearance, somewhat resembling that of the hair of the African negro. Should he allow his hair to grow, making but little use of his comb, the hair will hang in narrow ringlets 3 to 8 inches in length, a mode which is more common amongst the natives of the eastern islands of the group, being best described as the "mop-headed" style. More often, from a moderate amount of combing, the locks are loosely entangled, and the hair-mass assumes a somewhat bushy appearance, the arrangement into locks being still discernible and the surface of the hair presenting a tufted aspect. The majority of natives, however, produce by

constant combing a bushy periwig in which all the hairs are entangled independently into a loose frizzled mass, the separate locks being no longer discernible. Of these four styles of wearing the hair, I am inclined to view the "mop-headed" style as the result of the natural mode of growth, it being the one which the hair would assume if allowed to grow uncombed and uncut. The Solomon Islander, unfortunately, makes such a constant use of his comb that one rarely sees his hair as nature intended it to grow.

When, however, a man with bushy hair has been diving for some time, the hairs disentangling themselves to a great extent, gather together into long narrow ringlets—nature's "coiffure" of the Solomon Island native.

The hue of the hair in adults varies usually in accordance with the changes in the colour of the skin. Amongst the St. Christoval natives it agrees with the numbers 35 and 42 of the colour-types of M. Broca; whilst amongst the darker-hued natives of the islands of Bougainville Straits the hair is of a deeper hue, corresponding with the colour-types 34 and 49. The average thickness of eleven samples of hair from the former locality is from $\frac{1}{2.60}$ to $\frac{1}{2.70}$ of an inch; whilst in the latter locality, where the hair is of a darker hue, the hairs are individually coarser, ten samples giving an average thickness of $\frac{1}{2.10}$ to $\frac{1}{2.20}$ of an inch. The diameter of the spiral, when measurable, varies between 5 and 10 millimètres, its usual range throughout the group; but on account of the practice of combing, it is often difficult to measure it with any degree of accuracy.

I have not yet referred to the almost straight-haired element which has been infused amongst the inhabitants of the islands of Bougainville Straits. The individuals thus characterised have very dark skins, the hair being even darker and corresponding in hue with the colour-types 34 and 49. With such natives—whose faces, I should add, are flatter and the noses more *écrasés* than usual—the hair is almost straight, often erect, and giving the person a shock-headed appearance: whilst it may in some cases tend to gather into curls of a large spiral. Other natives possess hair which combines the straight and frizzly characters, giving the whole mass an appearance partly wavy and partly bushy. Small boys in this part of the group have frequently curly heads of hair with large flattened spirals. Traders tell me that straight-haired individuals are found amongst the hill-tribes of St. Christoval at the opposite end of the group: I met with one such native near Cape Keibeck, on the north coast of that island.

Amongst the natives of the eastern islands of the group the

hair is often stained a light-brown hue by the use of lime, a practice which frees the hair of vermin. The passing visitor might easily carry away with him the idea that such light-brown hair was a permanent character of these islanders; but on examination of adults he would usually find that the hair is much darker at the roots. The natives of the islands of Bougainville Straits—more generally the women and children—stain their hair by the use of a red ochreous earth, the colour of which, blended with the deep colour of the hair, produces a striking magenta hue.

With regard to the amount of hair on the face, limbs, and body, great diversity is observed, even amongst natives of the same village. Epilation is commonly employed; but there can be no doubt that the development of the hair varies quite independently of such a custom. Out of ten men taken promiscuously from one of the villages on the north coast of St. Christoval, perhaps five would have smooth faces; three would possess a small growth of hair on the chin and upper lip; the ninth would wear a beard, a moustache, and whiskers of moderate growth; whilst the tenth would present a shaggy beard and a hairy visage. With the majority of the Solomon Islanders, the surfaces of the body and limbs are comparatively free from hair; but hairy men are to be met with in most villages, and on one occasion in the vicinity of Cape Surville, the eastern extremity of St. Christoval, I visited a village where the proportion of the hairy-bodied, hairy-visaged men was in excess of the smooth-skinned element. Hairy visages are more commonly found amongst the natives of the Florida Islands. Amongst the natives of the islands of Bougainville Straits, it is usual for the chiefs and old men to grow a straggling scanty beard; the great bulk of the men, however, keeping their faces and chins free from hair. It would appear that in this group the qualities of treachery and ferocity are possessed in a greater degree by those communities in which hairy men prevail.

*The Colour of the Skin.*¹

In different parts of the Solomon group the colour of the skin varies considerably in shade from a very deep brown, exemplified by colour-type 42 of M. Broca, to a copperish hue best typified by colour-type 29. The darker shades I found to prevail amongst the natives of the islands of Bougainville Straits, where they correspond generally with the types 35 and

¹ The colour-types employed were those which are given in the "Anthropological Notes and Queries," published by the British Association in 1874.

42. The populations of St. Christoval and the adjoining islands have a somewhat lighter hue, corresponding more with the colour-types 35 and 28. One occasionally meets, however, amongst the prevailing dark hues with those of a much lighter copperish shade which corresponds with type 29. In the small island of Santa Catalina, which lies off the eastern extremity of St. Christoval, there is a large proportion of light-coloured individuals. This lighter hue of the skin is also frequent amongst the natives of the district on the north coast of Guadalcanar, which lies opposite the Rua Sura Islets.

The elderly natives are, as a rule, more dark-skinned than those of younger years, the difference in shade being attributable partly to a longer exposure by reason of their age to the influence of sun and weather, and partly to those structural changes in the skin which accompany advancing years. The colour is usually fairly uniform over the person; but amongst ten natives from the districts of the Uta Pass and Urasi, on the north coast of Malayta, the majority had their chests and faces of a lighter hue than their limbs and body, the difference being represented by that between 28 and 35 of the colour-types. I was unable to ascertain the cause of this difference.

Not unfrequently, amongst a group of dark-skinned natives a man may be observed whose skin is of a pale sickly hue, and who at the first glance may be thought to afford an example of recent intermingling of the Pacific races. On a closer examination, I always found that such men were covered from head to foot with an inveterate form of body-ringworm—a scaly skin eruption which probably affects in a greater or less degree two-fifths of the population of the Solomon group—and that in all their other physical characters they belonged to the Melanesian type. In its most aggravated and chronic condition this parasitical disease implicates the skin to such a degree that the rapid desiccation and desquamation of the epidermal cells lead to a partial decoloration of the deeper parts of the cuticle, as though the rate of the production of pigment was less rapid than the rate of its removal in the desquamative process. So prevalent is this disease in the island of Treasury, that four-fifths of the inhabitants are thus affected, and half of the chief's wives, who number between twenty-five and thirty, are covered with the eruption over limbs and trunk.

The Physical Characters of a Typical Solomon Islander.

Notwithstanding the variety in some of the characters of these natives, it is not a difficult matter to describe a typical individual who combines their most prominent and most

prevalent characteristics. Such a man would have a well-proportioned physique, a good carriage, and well-rounded limbs. His height would be about 5 feet 4 inches; his chest-girth between 34 and 35 inches; and his weight between 125 and 130 lbs. The colour of his skin would be a deep brown, corresponding with number 35 of the colour-types of M. Broca: and he would wear his hair in the style of a bushy periwig in which all the hairs are entangled independently into a loose frizzled mass. His face would have a moderate degree of subnasal prognathism, with projecting brows, deeply sunk orbits, short straight nose much depressed at the root, but sometimes arched, lips of moderate thickness and rather prominent, chin somewhat receding. His hairless face would have an expression of good humour, which is in accord with the cheerful temperament of these islanders. The form of his skull would be probably mesocephalic. The proportion of the length of the span of the extended arms to the height of the body, taking the latter as 100, would be represented by the index 106.7. The length of the upper limb would be exactly one-third the height of the body; and the tip of his middle finger would reach down to a point about $3\frac{1}{4}$ inches above the patella. The length of the lower limb would be slightly under one-half ($\frac{49}{100}$) of the height of the body; and the relations of the lengths of the upper and lower limbs to each other would be represented by the intermembral index 68.

Conclusion.

In conclusion, before referring to some of the remaining features of this paper, I would draw attention to the circumstance of my observations being confined to the coast tribes of this group. The larger islands, which may be compared in size to the county of Cornwall, are but thinly populated in their interior by tribes of more puny physique and less enterprising character, who are ill-suited to cope with their more robust and more warlike fellow-islanders of the coast. These bushmen, as they are called, are accredited by the coast natives with inferior mental capabilities as compared with their own. To call a man of the coast a bush-man is equivalent to calling him a stupid or a fool, a taunt which is commonly employed amongst the natives of the coast. The stone adzes and axes which have been discarded by the inhabitants on the coast are still employed by these bush-men. I was unable to make any measurements of these natives; but those I saw were usually shorter and of more savage aspect. They will probably be found to present purer Papuan characters than their fellows of the coast, with whom they wage an unceasing warfare.

The following are some of the leading points of this paper :—

1. Two constant variations in the type of the Solomon Island native are presented by the natives of the islands of Bougainville Straits, and the natives of St. Christoval and its adjoining islands at the opposite end of the group. In the former locality there exists a taller, darker, and more brachycephalic race; whilst in the latter locality the average native is shorter, of a lighter hue, and his skull has a more dolichocephalic index.

—	Average Height.		Colour of Skin.	Cephalic Index of living subject.
	ft.	in.		
St. Christoval.. ..	5	3½	Colour-types 35 and 28 ..	76
Bougainville Straits ..	5	4¼	„ 35 „ 42 ..	80·7

2. Amongst the natives of the islands of Bougainville Straits there is an infusion of a straight-haired element, characterised by hair almost black, and often by more flattened features.
3. The colour of the skin varies considerably in different parts of the group, and often in the same district, the range being represented by the colour-types 29 and 42 with intermediate shades.
4. A hundred measurements of the heads of natives give indices varying between 69·2 and 86·2; the whole series, however, displays a tendency to grouping around different medians, and thus points to the important inference that we cannot accept one type of the skull as a distinctive character of the Solomon Islander. There is, however, a marked preponderance of mesocephaly as shown in the table on page 276, which gives the indices corrected to actual skull measurements; but from my measurements being limited both in number and locality, I think the safest conclusion to draw is the most general one, viz., that all types of skulls, brachycephalic, mesocephalic, and dolichocephalic, are to be found prevailing amongst the natives of the Solomon group, the particular type being often constant in the same locality. If my measurements had been five times as numerous, and spread equally over the group, I might somewhat narrow my conclusions; and the perusal of my paper will show that brachycephaly might have formed a

more important factor in the series if I had measured the heads of the same number of natives from the north coast of Malayta which I measured in the districts of St. Christoval and of Bougainville Straits.

APPENDIX.

Measurements of Women.—I was only able to obtain measurements of six women, all of them from the small islands of Ugi and Santa Anna, off the St. Christoval coast.

Height.	Span of Arms. (Stature = 100)	Intermembral Index.	Distance between middle finger and patella.
ft. in.			Inches.
4 8	100·8	65	3½
4 9	102 1	68	3½
4 9½	104·3	68	4
4 10	104·7	71	—
5 0	106·9	—	Average 3½
5 3	108·3	Average 68	
Average 4 10½	104·5		

Arm and Height Index.	Leg and Height Index.	Cephalic Index.
32·5	48·5	71
33	48·5	75
33	50	76·8
33·5	51·5	76·8
34·5	—	79·6
35·5	Average 49·6	82·1
Average 33·7		

Considering the paucity of the observations, the average indices of the limb-measurements agree closely with those obtained for the men. The average height of the women would appear from these few observations to be that which they ought to possess as compared with the height of the men. This conclusion is based on the rule given by Topinard in his "Anthropology," that for a race of this stature 7 per cent. of the height of the man must be subtracted to obtain the true proportional height of the woman.

DISCUSSION.

The PRESIDENT, Mr. C. ROBERTS, Miss BUCKLAND, Mr. KERRY-NICHOLLS, Dr. GARSON, and Mr. OLDFIELD THOMAS joined in a discussion on Dr. Guppy's paper.

The AUTHOR, in reply to an inquiry of the President as to whether the labour traffic exercised a salutary or an injurious influence on the natives of the Solomon Islands in favouring or placing at a disadvantage those men who had worked on the colonial plantations, said he was not able to say whether such men were affected as to the length of their lives, or to the proneness to disease, but he should be inclined to the opinion that men who *do* return to their villages after an absence of three years in Fiji or Queensland would acquire in some degree a greater hardihood and greater pliability of constitution, which would give them an advantage over their fellows who remain all their lives in the same locality. In reply to Mr. Thomas, who referred to the author's estimate of the average height of a Solomon Island native as rather less than that which he would have judged it to be from the size of some skulls of these natives which Mr. Guppy had sent to the British Museum, the speaker pointed out that the range of his measurements extended over seventy in number, and referred to their arrangement in series as supporting his conclusion. In answer to some remarks by Dr. Garson, he observed that in his paper the expressions "Papuan" and "Polynesian" did not often occur, as he was desirous rather of collecting facts than of drawing conclusions, since his experience had been confined only to one of the many Pacific groups. Some of his conclusions, however, stood rather in opposition to views generally held; thus he found the colour of the skin and the form of the skin had no correlation—an experience which he believed was in conformity with that of Baron Miklukho Maclay in the Melanesian Islands. As regards the growth of the hair, Dr. Guppy found nothing to support the view that it grows in clusters from the scalp with hairless intermediate spaces. The bushy periwig he believed to be an artificial and not natural condition of the hair, the hair in its natural condition hanging in long narrow ringlets with a small diameter of spiral. The hair in many islands is stained a light brown colour by the use of lime, whilst in other islands a red ochreous earth is used, which, combining with the deep colour of the hair, produces a curious magenta tint. Mr. C. Roberts, having referred to the visit of Mr. C. F. Wood to the Solomon group in his yacht in 1873, asked the author whether he could confirm Mr. Wood's impression that there were signs of an older and somewhat higher state of the arts in those regions, instancing the skill shown in their large canoes as inconsistent with the present condition of the natives. Dr. Guppy remarked, in reply, that he had read Mr. Wood's account of his short visit to St. Christoval with interest, but had observed nothing to support such an impression. One would naturally expect, however, that in this borderland between the Polynesian and Papuan races there would

be a certain degree of incongruity from the mingling of two races in such different degrees of advancement.

MR. HYDE CLARKE then read a paper entitled "Observations on the Mexican Zodiac and Astrology," which was discussed by M. BERTIN and Professor KEANE.

The following papers were taken as read:—

On the SAKAIS. By ABRAHAM HALE, Esq.

[WITH PLATES XI to XIII.]

THE Malays contemptuously call the Sakais *Orang-utan*, "men of the woods," or *Orang-bukit*, "men of the hills"; and unless they happen to be foreign Malays, that is to say, from any of the Islands, they speak of themselves as *Orang-darat*, "men of the country." The Sakais, on the other hand, say that *they* are *Orang-darat*, and I suppose there can be no doubt that the Sakais were more original inhabitants of the peninsula than the Malays from which it takes its name; but whether there are living at the present time any representatives of a yet earlier race inhabiting this country I do not feel at all certain.

In this State of Perak there is at present besides the Sakais one other race, the Sēmang, probably of equal antiquity. As a general rule the Sakai race inhabits the left bank of the Perak River, and the Sēmang the right bank, and the two races are very antagonistic. In making constant inquiries about the races of the country, one hears of other races from the natives and also from other sources. Thus M. De Morgan, during his late journey in the interior and amongst the high mountains, I understand, found a race of men much taller and finer than the average Sakai, and also heard of a wild man who was caught by the Sakais, and was said to be almost a dwarf, and covered with a quantity of reddish hair. How much reliance he places on the evidence he received will doubtless appear in his journals, as also whether he considered the larger race of men to be Sakais or not.

Some six months ago I was told by a Sakai chief in Kintah that there was a race who did not know anything about iron, but who used stone axes to cut down trees. Being anxious to find this people I started on the journey from which I have just returned, having failed to find or even gain any authentic information about such people. This was, I believe, also the result of De Morgan's inquiries, who of course was able to penetrate much further than

myself, starting as he did with a properly equipped expedition party.

I am told that M. De Morgan found two stone axes in the houses of Sakais; but that these were not in use, having been found either on the ground or below the surface by the present owners, and preserved as curiosities or relics by them. I also found a very beautifully shaped little axe in the house of the head chief of the Ulu Kintah Sakais, which the owner told me he discovered in his tin mine. He had no especial reverence for it, only using it occasionally to sharpen his knife on, and not having the least idea what it was, he was very glad to exchange it for a parong (chopping knife). I made very strict inquiries as to the circumstances of its discovery, and learned that it was found in a small hill worked for tin by the man who gave it to me. It was in a bed of sand containing some timber and a few sub-angular pieces of quartz and other small stones, 3 feet under the surface, and rather less above the bed of drift containing the tin ores. I found also by inquiry that there was some clay above the sand and below the made earth; consequently I conjecture that the specimen was lying on the top of the sand drift bed, as it shows scarcely any signs of water wear, being almost as perfect as when first ground out of the pebble picked out of the river, except that it shows the mark where the Sakai had for a long time sharpened his knife on it (Plate XI, fig. 1). If there are any tribes still living in the stone age they must be looked for still further up country.

The Sakais are essentially landmen; living up here as they do in the mountains, and near the sources of the rivers where it is quite impossible to navigate them, they know nothing about boat-building, not even to the extent of making a bamboo raft. In this the Sēmangs are their masters, as they do make rafts, of about twenty or thirty large bamboos on which they float down the Perak River nearly to Kwāla Kangsar; but even they walk back again.

During the past year I have seen a great deal of the Sakai people, and have always found them, where not demoralised by Malay intercourse, most kind and simple-hearted, always anxious to do their best to assist any white man that happens to be in want of assistance, and I find that the opinion of other people out here who have had dealings with them coincides with mine in this respect. I had to experience an example of their untrustworthiness when I started on a journey the other day, but that was from the hands of a chief who lived close to the Perak River, and who was more like a Malay in character than a Sakai. He was in fact an opium-smoker, so that my promise to supply him with opium and rice if he would guide me up into

the mountains was quite sufficient to induce him to deceive me most wofully. He took me only as far as a Sakai village one day's journey beyond Goping, where lived some of his relations whom he wished to see, and found my rice handy to help him on his journey. After he had had his talk with his friends he quietly informed me that he did not know of any other Sakai villages farther up country, and then he and his men left me and my baggage to get on in the best way that we could. I stayed two nights at this village trying to get the Sakais to take me on, but they held to the other chief's statement that there were no more wild tribes that they knew of in that direction; and besides which the river Kampūr was impassable, so that I had to retrace my steps to Goping, with the disagreeable feeling of having lost a week of, to me, very precious time. The Sakais at this place also were much too civilised to answer my purposes. I did, however, succeed in getting a few specimens of hair, and also learning a few Sakai words.

Near Goping I was lucky enough to find a gentleman, M. Ardouin, who went through with M. De Morgan. He kindly got me some Malays who had accompanied them on their expedition, and with these I determined to try and get into the mountains from Kending, as I had done once before about six months ago. In this I was fairly successful, and spent a most enjoyable week amongst quite a different class of Sakais than the people who lived nearer the Malay Kampongs. The head chief of the Ulu Kintah Sakais kindly gave me two men to guide me from place to place, and with these and four Mandayhaynugs I went from house to house exchanging my beads, tobacco, common sarongs, and other small articles for their own manufactured things of daily use, and making notes of what I considered most important. Everywhere I was received most hospitably. When I entered a house a bed place for myself and my Malays was immediately prepared in the best situation; water was brought for me to drink; maize or tapioca roots (*ubi chien*) were put into the ashes to roast; everybody belonging to the house was called in from the jungle to see me and my parcels of beads, &c.; and then after I had had a wash and some food we spent the rest of the day and evening in talking and bartering. Money is as yet almost unknown; in fact, at one house I was most innocently offered a necklace containing amongst other precious things, such as monkeys' teeth, snails' shells, brass rings, monkeys' hair in tufts, and strings of black and white seeds, nearly \$2.00 in small silver and copper coins, all of which the owner was anxious to exchange for one string of glass beads, value ten cents, and a small tobacco box with a mirror on the lid, value four cents more. My 'cute Malays were quite disgusted when I insisted on the owner of

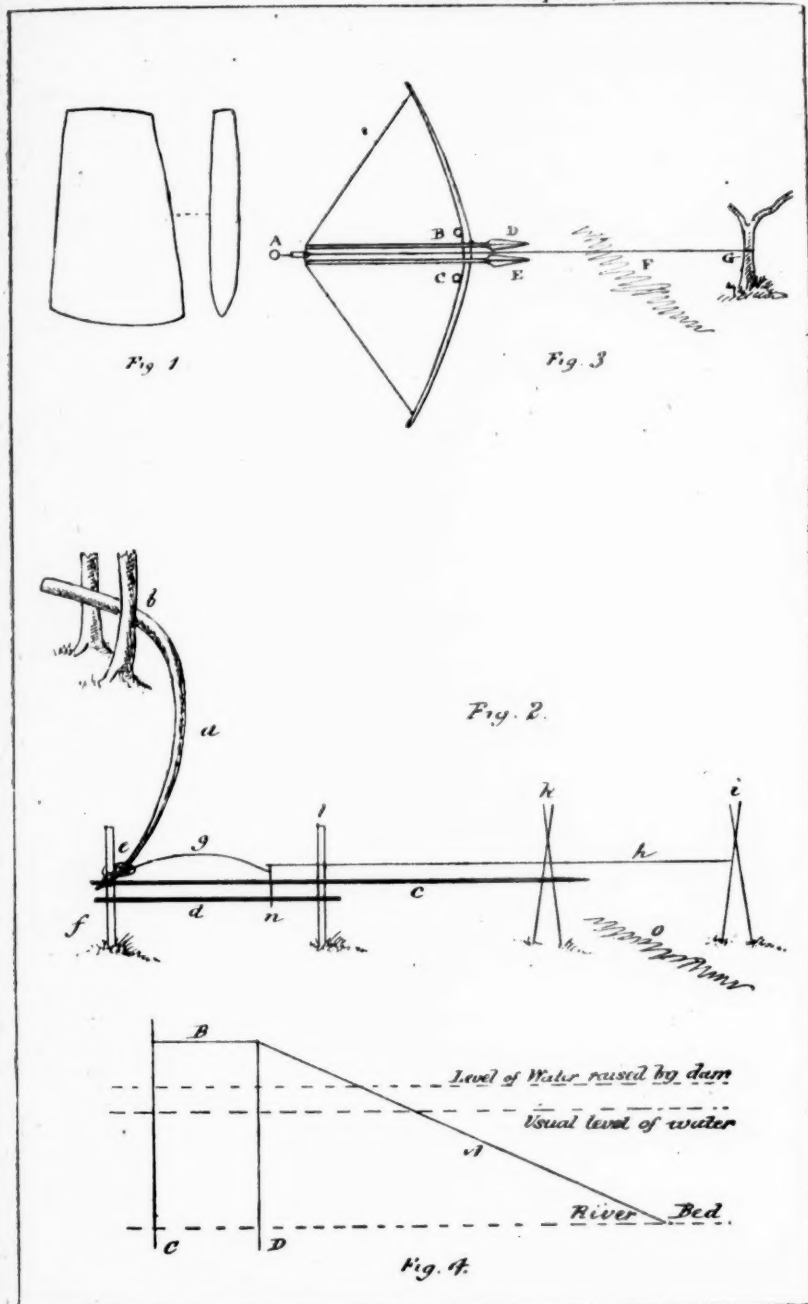
the necklace accepting a sarong, value thirty cents, besides more beads than she had asked for in return for the article in question. The Malays themselves cheat the Sakais most remorselessly. I was told by one of my men that he could always get tin ores sufficient to smelt ten cattles of tin for a parong, value thirty cents. I know at the present time several Malays who are getting a great deal of money in this way, but the Malays do not like doing the work much, as they have to live amongst the Sakais for some time, when they invariably catch some of the very disagreeable skin diseases with which the Sakais are almost universally infected, and which are of course the natural result of the fact that the Sakais hardly ever bathe. Such diseases are *Kurap* (scurf), *Kurap hyam* (ringworm), and the much-dreaded *Kudis*, a very bad form of itch. A European living among them must also of course be prepared for these almost certain consequences.

It must be understood that the Sakais whom I visited have long been in communication with the Malays, who live only a few days' journey away, and can most of them talk the Malay language; besides which they have procured a great deal of property from the Malays, such as wood-cutting tools, sarongs, cooking utensils, &c. The whole of the time that I stayed amongst them I was never more than four days' journey away from Kending, which is the last Malay place up the Kintah Valley.

Weapons, Traps for Animals, Fish, &c.

Sumpitan.—The sumpitan is the chief weapon of the Sakais—in fact, so far as I am aware, the only really native one that they use; they purchase spears, krisses, parongs, and other things from the Malays, but I believe this to be the only weapon they make themselves. I am told that they make spears with hardened bamboo blades with which to encounter animals. I have seen these spears, but the Sakais always tell me that they are only used to set up in the jungle as traps.

As so many erroneous ideas are current about the blowpipe, perhaps it will bear once more being described. I have six sumpitans, purchased at different times from Sakais; the respective lengths are as follows:—7 feet 7 inches, 7 feet 5 inches, 7 feet 2 inches, 6 feet 9 inches, 6 feet 4 inches, and 6 feet 1½ inches. The sumpitan consists of a straight tube of bamboo, of either one or two joints (those with only one joint are very rare); if made of two joints, the joint itself is cut out and the two pieces most carefully joined and secured by a flange: this is fitted with a wooden mouthpiece, something like the mouthpiece of a cornet. The tube is always kept



inside another tube of bamboo to preserve it from damage, as it is very thin and delicate; the bore of the tube varies from 9 millimetres to 15 mm. The darts are from 8 inches to 11 inches long, and about 1 mm. in diameter; they are made from the hard midrib of the Bèrettam palm leaf; one end is carefully sharpened and dressed with poison, the other is provided with a small hub of the pith of the same palm, so that it has plenty of room in the tube. The poison most generally used is the sap of the Ipoh tree; this is boiled down to the consistency of thick treacle in a large quantity; it will then keep for any length of time in a properly corked bamboo; when required for use, a little is put on a large spatula and warmed over the fire with a little water and then put on to the end of the dart. To use the sumpitan it is also necessary to have a supply of some soft material, like raw cotton, to use as a wad behind the dart to prevent the escape of wind when blowing the dart out of the tube. The Sakais use for this purpose the velvety covering found at the base of the midribs of the leaves of some rattans: this product is also used as tinder to catch the sparks from the flint and steel.

The sumpitan is a very deadly weapon for any animal up to the size of a siamang, and up to the distance of sixty yards. A Sakai clever in the use of it will put five darts out of six into a common playing card at fifty yards distance. The sheaths which contain the darts are generally very nicely ornamented; they are supported round the waist by a cord of native manufacture, and fastened by a bone of a monkey, the upper mandible of a hornbill, or something of that description; at the bottom of the sheath is always kept a supply of beeswax with which to polish it, and also the outer case of the sumpitan; this, together with the fact that they are always hung over the fire where the smoke gets at them gives them the rich red colour which the Sakais admire.

Belantay.—The belantay, or spear-trap, is used of a great many sizes, for game as large as the rhinoceros down to animals of the size of the porcupine. When used for large game the spear is either made entirely of bamboo, hardened by being hung over the fire for a long time, or the blade only is bamboo, securely fastened to a stick of strong wood; for small animals a simple stick of hard wood only is used, the point of which has been hardened in the fire.

This belantay is shown set in fig. 2, Plate XI.

- (a) A very strong bender held between two trees at (b).
- (c) The spear which is securely fastened to the end of the bender (a).
- (f) and (l) Two strong stumps stuck in the ground.

(*d*) A strong straight piece of wood fastened to the two stumps.

(*k*) and (*i*) Two pairs of sticks (*k*) serve as a support for the point of the spear, and to (*i*) is attached a fine string (*h*) of rattan or otherwise, which is stretched across (*o*) the track of the animal.

(*e*) A strong loop of bamboo fastened to the stumps (*f*).

The trap is set by the large bender being drawn back to the stump (*f*). The loop of bamboo is then taken across its end above it, the small bender (*g*) is then passed through the loop, the other end of the small bender is then held down by a (*n*) ring of rattan, which plays along the pole (*d*); to this ring is fastened the string (*h*). An animal passing along the path (*o*) strikes the string (*h*), which pulls away the ring (*n*), thus releasing the small bender (*g*), which flies away, releasing the strong bender (*a*), which springs back to its natural place as far as the stump (*f*), carrying with it the spear (*c*) with all the force available according to the strength of the bender, and of course spearing any animal that is passing along the path.

This belantay does not release the spear which is fastened to the end of the bender; by a slight modification, however, in which the bender is so arranged as to strike the butt end of the spear, it is by some Sakai tribes made to fly like an arrow across the track of the passing animal.

Whilst I was making my inquiries concerning this trap at the house of a Sakai chief, who had ordered one to be set up for my inspection, one of my Malays, a Perak man, said that he knew how to make a belantay of another description, which he accordingly did. This belantay (concerning which the Sakais declared utter ignorance) is shown in fig. 3, Plate XI; it is a bow of properly elastic wood, about 14 feet long, drawn by a rattan string. *A B C* are three strong posts to which it was fastened. *D E* are two lembings (Malay spears), one or two may be used. *F* is a string stretched across the track of the animal, which releases the bowstring by a similar arrangement as in fig. 2, Plate XI. This bow is set about 15 feet away from the path, and the spears are discharged like arrows.

Neither the Malays nor Orang Sakai use the bow and arrow as a weapon, but the Orang Sēmang use a very fine bow, 7 feet high, with highly finished arrows, which are armed with iron points of good workmanship, and poisoned.

Springs.—The Sakais use springs made of rattans, and of course set in several ways as circumstances require; but the most usual thing is a simple loop of rattan drawn tight by a strong bender: with these they catch rats, squirrels, and animals as large as the porcupine.

Birdlime.—The sap of a gutta tree is sufficiently boiled to make it very adhesive, quantities of thin slips of rattan are doctored with it, and then planted over the ground which is frequented by any species of bird small enough; and of some gregarious sorts, like the little paddy bird, quantities are taken.

Fishing.—They do not appear to know anything of angling. But they make very beautiful casting nets (Jalal), making the string themselves of the inner bark of a creeper, by twisting two strands together on the thigh in the usual way. At present these jalals are weighted with tin in the same way as the Malays, the tin rings being bought of them.

I also saw an extensive fish trap in the Kintah River, where it was about sixty yards wide and rather swift.

The section of this trap is shown in fig. 4, Plate XI. *A* is a grating of bamboo. *B* a platform to catch the fish. *C* and *D* two rows of strong posts. This grating is built halfway across the river, and being strongly made will last a year. During flood times many fish are taken, but more during the driest season, when the other half of the river is dammed, and all the water made to go through the grating. To assist this process a certain poisonous jungle root is thrown into the river above the grating some distance, which drives the fish down half stupified; often several hundreds of fish are taken by this means, and of large size. The Sakais live on the mountain tops and do not go down to the big rivers for fish unless forced to do so by scarcity of food.

Religion, Superstitions, &c.

On first acquaintance with any savage race it is of course very hard to find out anything of their religion. The following facts must therefore be taken for what they are worth.

When a person dies they bury him or her, and with the body they also bury some articles of the deceased in daily use, such as his small rattan bag for tobacco, a necklace of beads, tinder box, or, if a woman, her comb, necklace, or bracelets. Invariably the house in which a person dies is burnt down and the place entirely forsaken, even at the possible loss of a coming crop of tapioca or sugar-cane.

A man goes to a considerable distance for a wife, generally to a tribe who speak quite a different dialect. He gives the parents presents of considerable value, such as sarongs, or bill hooks (parongs) purchased from Malays, or he may clear one or two acres of jungle and plant it with tapioca, sugar-cane, &c., and present to them.

They have a certain amount of veneration for objects which belonged to deceased friends and relations. Thus I tried to

exchange some beads for a necklace which was in the possession of an old woman, but she would not part with it, alleging as a reason that it belonged to a friend who had been dead for a very long time.

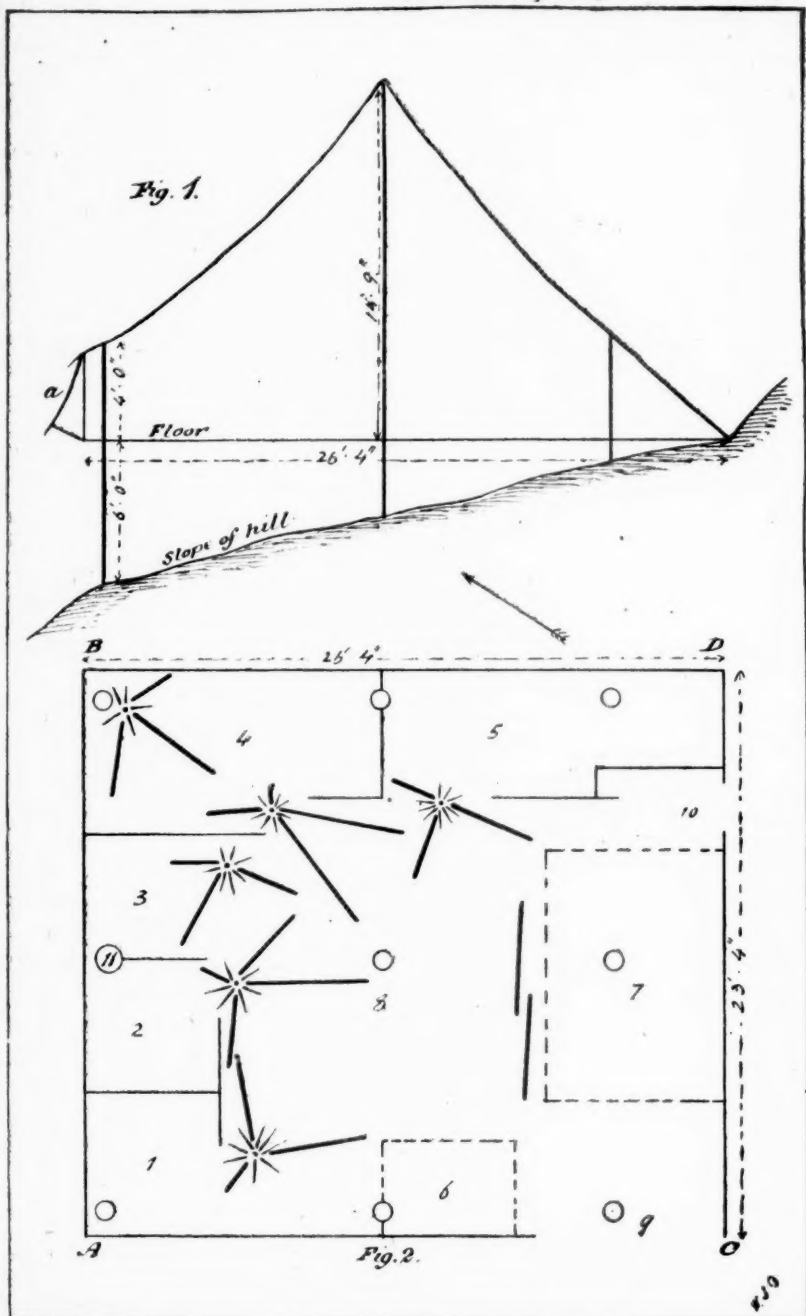
The drum which belongs to the whole house also is very difficult to purchase; at several places they refused to let me have one at any price. Ultimately I secured one at the extravagant price of one cooking saucepan, two parongs, one cherenim (tobacco box) full of tobacco to every man, and a brass Malay hair-pin to every woman in the house, a cost of more than \$2.00, the reason alleged in every case being that the old people of the tribe liked to hear it in the evenings.

One whisker of a tiger (a single bristle) was offered to me for the rather high rate of twelve parongs (\$6.00). I ultimately secured it for one parong, because it was in a nicely ornamented bamboo case. Tiger's teeth were valued only at about five cents' worth of beads, but the whiskers are of very great value to insert into the handles of any weapons, as they are supposed to make the wearer invincible. This superstition is shared by Malays, and here in Kwāla Kangsar I have been offered \$4.00 for my single bristle.

For description of the fruit festival see Appendix, page 299.

Dress, Ornaments, &c.

The primitive dress of the Sakais is kain' traap (bark cloth); a strip of this is twisted round the waist and drawn between the legs, and the Sakai man or woman is dressed so far as actual clothes are concerned. Even those Sakais who live near Malays, and are able to buy sarongs and Chinese trowsers, always when they go into the jungle return to their old dress, though very often an old rag is substituted for the bark cloth. The men appear to wear no ornaments except very small bracelets and waistbelts made of a black leafless aquatic creeper, found growing on stones under water in the mountain streams, and called by the Malays, who are also fond of wearing it, *arca battu* (stone creeper). The women wear bracelets and necklaces made of seeds, shells, certain sweet-smelling roots, and anything that they can get from the Malays which can be strung on. I have a necklace which I purchased from an old woman; it contains nine strings of black and white seeds differently arranged, a string of old Malay copper coins, a few glass beads, one tip of a squirrel's tail, two tufts of monkey's hair, a serpent ring made of brass, that is to say, a spiral of brass wire, five snails' shells, and the brass support of the ribs of an umbrella. This is about the average of a Sakai necklace, and one of their greatest



SECTION AND PLAN OF A SAKAI HOUSE.

ambitions seems to be to replace the black and white seeds with glass beads.

Through the septum of the nose they wear either a porcupine's quill or a long bone of a fish or bird or monkey. They also wear the same things in their ears; there appears to be a tendency to make the holes in the ears large. I observed two women wearing rolls of cloth as large as my little finger, and I found great difficulty in abstracting one of these, as it fitted very tightly. Except close to the Malay villages, the Malay women wear their hair in true negrito style, that is, standing out from their head all round in a great mop; but where they have any intercourse with Malays, they tie it back in a knot like the Malays. Indoors, if they have it, they always wear the Malay sarong, and in one house, from an excess of modesty rather rare amongst savages, the women would not dance until I had given them each a strip of common cotton stuff to cover the breast. They wear quantities of brass wire bracelets, and when they dance, a sort of high turban made of bark cloth, or a wreath of sweet-smelling grasses and leaves. The women also ornament their faces and their breasts with red figures, traced with the juice of the fruit of the anatto (*Bixa orellana*), which they cultivate for that purpose.

Houses, Habits of Living, &c.

I annex a sketch plan of a Sakai house, in which I stayed two nights. I proceed to describe it (see figs. 1 and 2, Plate XII). As shown in the elevation, fig. 1, it is built on the slope of a hill, close to the top (I guessed this hill to be about 3,500 feet high). The roof is thatched with the common Brettam attaps in the same way as Malay houses, except that it is much more carelessly done. The whole house is supported on nine posts, marked *O* on the plan, fig. 2; these posts are very slight, and some of them crooked, but as additional support one of them is the trunk of a large tree cut off to the proper height, and stripped of its bark to kill it (marked 11, fig. 2). Except these nine timbers, the house, rafters, uprights of the walls, floor joists, and everything is entirely built of bamboo for timber. The walls are covered with attaps tied into great sheets, and hanging only from under the eaves and from the same height on the end walls, these sheets are opened outwards in fine weather like shutters, as at *a*, Plate XII, fig. 1, thus making the house very comfortable and airy. The house which I am describing, and which may be considered a typical one, except that the Sakais are very adaptable to circumstances, using bamboo or sticks for timber, bark or leaves for the walls, &c.,

was situated close to the top of the hill, more than one hour's hard climb above the nearest water. It was surrounded by a felled space of about two acres, where the inhabitants cultivated their tapioca, maize, sugar-cane, and tobacco. The house contained, without my party, sixteen inhabitants, disposed as follows (Plate XII, fig. 2):—Division 1. An old man and his wife equally old; 2. Their son, aged about nineteen, and his wife; 3. A middle-aged woman whose husband was absent; 4. A man with two wives and two children, one by each wife, one child being about six years old, the other about two; 5. A man with his wife and two young children; 6. A raised sleeping place for two sons of No. 5, one about thirteen and one fifteen, both bachelors. When I arrived, the raised place, marked 7, was put up for me and three of my Malays to sleep on. Two other Malays took possession of the bed-place No. 6, whose proper tenants slept on the floor amongst the logs at 8, with my two Sakais. At 9 is a door in the end wall, and at 10 another cut in the slope of the roof. The dotted lines show the limits of the raised bed-places at 6 and 7; these are platforms, about 2 feet high, made of bamboo; the Sakais sleep on them without either mat or pillow—I found it quite hard enough with a double mat. The slighter black lines show the limits of each family's quarters; they are divided by very slight partitions of split bamboo, 2 feet high. The inmates sleep on the floor. The thick black lines, converging towards the stars, show the different hearths, each family having its own. It will be observed that two hearths are allotted to the division marked 4. I noticed in three instances where a man had two wives, each woman had her own separate hearth. These hearths are very simple constructions: first a mat of leaves about 3 feet in diameter is laid on the floor, over this is spread about 3 inches of earth, and a fire lighted, which once lighted is not allowed to go out. For although every Sakai carries a tinder-box, it is much easier to blow up a smouldering log into a blaze than to re-kindle it. Three or four long logs of suitable wood, each about 9 inches in diameter, are arranged so that their ends approach on the centre of the hearth, a small fire is lighted in the centre with sticks; the logs keep the fire for weeks, and as they burn away they are gradually drawn into the fire. The burning ends serve as a support for a saucepan, and the accumulated ashes below to roast tapioca and sweet potatoes in. As there are always several other logs lying about the floor, drying ready for use, it is not very easy to get about without knocking one's shins.

As soon as it begins to get light, the Sakai gets up and prepares his breakfast, some roasted tapioca, perhaps with a

stick of sugar-cane; the men and women sit in the doorways of their small places; if the woman has a child, he will probably be employed in disentangling his mother's hair with a comb (figs. 1 and 2, Plate XIII) or bamboo pin (figs. 3 and 4, Plate XIII), and—it is no use denying that these people are very dirty—destroying the animal life there found. In the meantime the fires will be all burning up briskly, for the mornings are very chilly on these hill-tops, and the Sakais sleep in the very scanty attire which they wear all day. After breakfast, some of them shoulder their *aga*, a sort of carrying basket slung on to the back like a knapsack, and with a parang or sumpitan go off into the jungle after food or firewood, or damma for torches, or whatever may be the necessity of the day. The rest stay at home and work about the house, making sumpitan darts, carving bamboo sticks into patterns, which bamboos are destined to hold some of the numerous necessities of savage life, and a bamboo joint which was required for use would seem imperfect unless ornamented. During all this time they always keep something ready to eat. They have, so far as I could make out, only two regular meal times, early morning and midnight; but during the day, if indoors, they are continually eating either sweet potato or tapioca, or sucking sugar-cane. Only once during my journey have I seen animal food in a Sakai house other than that which I introduced myself. This was part of a stag which had been taken with a *belantay* (spring spear), and which had been shared by several houses. In spite of the very deadly weapon with which they are armed—the sumpitan—they never search for game until everything else fails.

Those who had gone out in the morning generally return about 3 P.M., heavily laden with jungle produce. From this time up to about 9 P.M., eating, talking, and if there should be a good supply of damma for torches, perhaps singing and dancing, is indulged in for an hour or two. About 9 P.M. everybody turns in, only to wake up again at midnight, at which time the fires are lighted up again, and some more tapioca or sweet potato roasted and eaten, after which they again go to sleep until morning. This midnight supper seems to be an invariable custom; it occurred every night that I slept in Sakai houses.

The Sakai Song and Dance.

On two occasions I was enabled to witness a performance of the song and dance by Sakais in their own style, once at the house of which Plate XII, fig. 2, is the ground plan, and once at another similar house.

The performance is commenced by a man who takes the

drum, a very rough instrument made from a section of a tree 2 feet 6 inches long and 1 foot 2 inches in diameter. This is hollowed out by burning and chopping until the circumference is about half an inch in thickness. Across one end the skin of a siamang (gibbon)—or of apparently any animal—is stretched and kept taut by means of rattan cords and wedges. This is the only instrument used in the performance. After about five minutes' beating of the drum to a very monotonous 1.2 time tune, another man gets up and performs a dance, or perhaps two men at the same time: this dance is a very simple performance of certain gesticulations, the principal of which is a sort of courtesy made once to every 1.2 beat of the drum; at the same time grotesque gestures are made with the hands. After about half-an-hour of this description of dancing, the men all squat about in convenient places on the logs, and commence to sing or chant in the same monotonous 1.2 time. The following is one of the *dobokh*, or songs. I wrote this down as it was sung, and got the more correct pronunciation afterwards; this is easily done, as one man chants a line, or rather word, first by himself, and then all the rest sing it in chorus:—

Sakai.	Malay.	English.
Jerlemoi	Gunong	Mountain.
Jerreboo	Bukit	Hill.
Tra-ap	Turong	To descend.
Cherook	Jalan	Road.
Al our	Ayer kechil	Stream.
Moug-alas	Chaukat. . . .	Hillock.
Yung-bêlah	Gunong	Riam.
Gass-ahr	Ditto	Ungus.
Yer-rail	Ditto	Chabbong.
Mah-wah	Ditto	In Ulu Burong.
Youg-yup	Ditto	Ditto.
Guss-aal	Ditto	In Ulu Kerlon.
Chou-goat	Ditto	In Ulu Burong.
Laut-urrrh	Ditto	Two months' journey from Kintah.
Jel-li	—	—
Yeu-yeel	—	—
Ber-rok	Ditto	Sungei Përrang.
Lan-noh	Ditto	Ulu Sungei Riah.
Bërrap-pit	Ditto	Ditto.
Ed-joah	Ditto	Ditto Kintah.
Jah-goo	Ditto	Ditto.
Bê-nah	Ditto	Near Tambou.
Ba-käh	Ditto	Kintah.
Tad-dah	—	Ditto.
Cheb-bëarih	—	Ditto.
Tam-boon	—	Tambou.
Bët-eham	—	Name of a Malay village.
Chab-bärh	—	River Chôh.

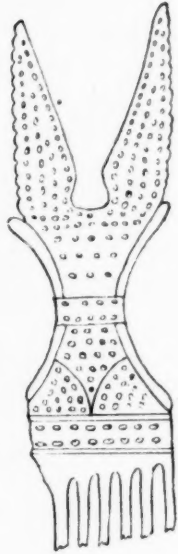


Fig 1



Fig 2

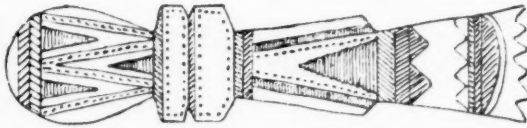


Fig 3

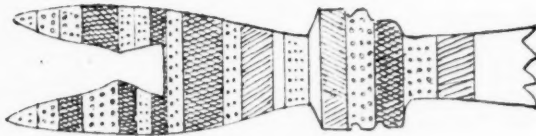


Fig 4

The song is closed by a long-drawn shout or cry something like "Heugh." From this it would appear that the Sakais' song is nothing more or less than a repetition of the names of a number of mountains, rivers, &c. This, in fact, is all that I could make of it, except that the names were said most emphatically to be those in the Sakai country. This has some little significance, as all these places are between the latitudes of $4^{\circ} 30'$ and 5° , and all in the Kintah watershed excepting the mountain called Laut-urrah, which was said to be two months' journey away, but this may be very fairly considered as a little indefinite. From the evidence of the song I should consider that it described a country of not very large limits, some of the places being still occupied by Sakais and some having been so originally; amongst the latter being Tambou, now a Malay village with cocoanut palms at least twenty years old, and consequently having been in the possession of Malays for that time, as Sakais do not plant cocoanuts.

After these songs have been sung for perhaps an hour, the women come forward and commence to perform; it can scarcely be called a dance, as they do not move from place to place, only go through certain evolutions as they stand. First they clap their hands in time to the drum for a few bars, at the same time repeating the syllables Sough! sough! sough! and then Chaep! chaep! chaep!¹ perhaps six or eight times, each at the same time curtseying once to every beat of time rather low; then the arms are dropped to the sides, and the body is turned from side to side from the hips, and the arms allowed to swing round loosely with it, once to every beat of time; at the same time a deep curtsey is made as before: this is repeated about six times. It has a very pretty effect, as it is done by a graceful swaying movement. After this they stand still, with the exception of a very slight curtsey to every beat of time, at the same time one arm is placed akimbo, and the other held out with the hand loosely open, and in time to the drum the forearm is turned so as to present the hand with the palm alternately upwards and downwards with a very slight, at the same time graceful, movement: this is continued until the end of the song, when the whole process is repeated.

I could not discover that there was anything else in connection with the string of names. It may be that it describes some journey, or other incident, as the few introductory words would seem to intimate, but I could not make out anything to that effect.

Besides the drum they have a long bamboo flute with three

¹ These words are equal to "Yes! Yes! Go on! Go on!"—*i.e.*, encouraging cries.

holes, a sort of whistle also of bamboo, a Jew's harp also of bamboo, and a guitar with three strings made of fine rattans stretched on a large joint of bamboo. This last I have not seen in the Kintah district, only near the Perak River. None of these instruments, however, are used to accompany the dance or song.

Food.

The Sakais in a wild state eat everything in the way of animal food that they can get. Even snakes and lizards are not refused. But they do not appear to bestir themselves in the search of it until vegetable food is on the point of exhaustion.

The same applies to their fishing. Once in about three months a large party of them will make a journey of perhaps a week to a suitable place on one of the big rivers, and then by means of dams, &c., they will secure a large supply of fish and have a great feast; they do not understand drying it, consequently it only means a few days' feasting, whilst the fish lasts good.

The Sakais nearer the Malays cultivate tapioca, sugar-cane, and sweet potatoes. But M. De Morgan, I believe, found a tribe who cultivated only millet.

I discovered two manufactured foods. One was made from the tubers of a wild tapioca; these roots, if eaten in their natural state, are said to cause a sort of drunkenness (*maboo*) or perhaps sleepiness. The Sakais sink them to about 4 feet deep in the mud of a swamp; after they have lain there four nights they are lifted and brought home, and the women set to work to rasp the now soft roots up into a pulp, using a prickly rattan for a rasp. At this time they have a particularly sour and pungent smell, which I can only describe as a mixture of very sour milk and rotten eggs. The pulp is then put into a mat and the juice most carefully squeezed out. This is done by a simple lever, one end of a long piece of timber being put under the plate of the house, the bag of pulp placed under the lever, and a woman sitting on the other end soon expresses all the water. The dried pulp is then squeezed into a joint of bamboo and dried over the fire; it will then keep for a month. It is then quite a good food, though, of course, it has a very pungent sour smell. This food is called by the Sakais, *koyee*.

Another sort of seasoning, or *sambal*, as the Malays call it, is made from the seeds of a tree, called by Malays and Sakais also *Präh*, and hence the name of the food is *Serüm präh*—*Serüm* being the word used to express anything squeezed into a joint of bamboo. These seeds are sunk into a swamp for between three and four months, carefully enclosed in a *sumpet* (mat bag), to which a lifting string has been secured. They are then lifted

and pounded into a bamboo. The sambal will then keep for a great time; it is very good, having a taste between toasted cheese and fried ham. But of course the odour is very pungent; as, however, this is the case with so many of the Malay foods which one constantly eats, it is unnoticeable.¹

APPENDIX.

Description of a Sakai Fruit Festival.

[Added after the Paper had been read.]

A few days ago I was invited by a Sakai chief—whose tribe, consisting of about sixty men with their families, inhabit some hill-tops about 1,000 feet above the level of the Kintah River at a place marked Tanjang Keukong on the maps—to his annual "Cheuteh," or fruit festival, which he had so arranged as to answer the purpose of a "house-warming," in respect of a new house which he had just built. I must premise for the better understanding of my description that this chief, and, in fact, all of the different tribes of Sakais that live near the Malay Kampong, are able to speak Malay more or less fluently, as they are in the habit of trading with the Malays for cloth, tobacco, rice, parrangs, beads, &c., for which they give in exchange tin, sand, or their own labour in felling jungle for the Malays; in these bargains the Malays cheat them most unmercifully. The Malay chiefs have also for a long time exercised a little authority over those Sakais that live within their reach, nominating their chiefs and giving them titles answering to the titles of their own chiefs in the times of the Rajas.

I was accompanied on this journey by another officer of this service, and by several of our Malay chiefs. After riding as far as the roads permitted, we went on for a good day's journey on elephants, arriving at the Sakai chief's ledang late in the afternoon. We found that the chief had got all his tribe together, and had furthermore some invited guests from the other side of the main range, that is, from Kelantan. These Kelantan Sakais were much finer-looking men, and had evidently not been spoiled by too much intercourse with Malays, as they were dressed only in their native dress, consisting of a long strip of bark cloth twisted round their loins and passed between the legs. As the Sakai chief had been awaiting my arrival for several days, which was more or less uncertain, he had not prepared his feast, and

¹ Mr. Hale's paper is accompanied by a vocabulary of about two hundred words and phrases, in manuscript, which is preserved in the Library of the Anthropological Institute.

we had to wait until the next night for the festivities. During the next day the men went off into the jungle and collected wild fruits: these were presented to us and our Malay friends, and the whole day was passed in eating jungle fruit and cooking a bag of rice that I had brought with me for the Sakais in preparation for the feast in the evening; we also procured a goodly stock of bark cloth, ornaments, and other articles, some of which are particularly interesting, in exchange for Malay sarrangs, knives, &c., of which we had taken care to provide ourselves with a stock, much to the disgust of the Malays, who considered that we bartered our ware at a much too low rate of exchange.

Rice and tobacco and some materials we supplied them with as our share to the banquet.

About 5 P.M. a large portion of the bare bamboo floor of the house was covered with banana leaves and the boiled rice heaped about on it at convenient distances; then, after the chief had prayed for some time over a cocoanut shell filled with live coals, on which was constantly placed pieces of aromatic gum and wood of different descriptions, the whole party fell to work at the rice, which very soon disappeared down their throats. After this, dancing, accompanied by singing and the music of a drum, an old paraffin tin and some bamboos struck on the floor of the house, was continued until daylight next morning. From the very primitive instruments of music used it might be thought that discordant noises would have resulted. This was, however, not the case; the empty oil can was suspended from the roof, but only very gently touched with the hand. My friend who accompanied me and I both considered that the effect was perfectly harmonious; the music of the Sakais is, in fact, very pretty, much more so than Malay music as a rule.

I took the opportunity to question the chief concerning his prayer, which he delivered in a queer mixture of Malay and Sakai, preceding each string of petitions by the expression "Sumbat," which he pronounced after having blown the fumes of his censer from his hand, most probably to the four winds, as he faced to four different points of the compass, pronouncing the word and blowing the fumes to each; he told me that the word "Sumbat" meant the same as *Salamat* means in Malay, *i.e.*, either "Hail" or "Peace be unto you." I asked him to whom he prayed; he said to the *Hautues*. Now *Hautu* in Malay may be taken to mean either "Ghost" or "Spirit" only—not God; the Spirit may also be either benignant or malignant. I then asked him to tell me what *Hautu*, and he said the *Hautues* of the forest, of the mountains, of the rivers, of the winds, also the *Hautues* of Malay and Sakai chiefs who had died, also the

Hautues of headache, of stomach-ache, the Hautues that caused his people to gamble, to smoke opium, and who sent all sorts of disputes and who sent mosquitoes. He prayed to these Hautues to be kind to him and to his people—to send plenty of food to eat, and not to send any evil things. He further said that Sakais do not pray to "Allah," that is, to God. The question undecided in my mind, as yet, is whether this worship was learnt from the Sakais by the Malay Pawangs of the present day who practise it, or *vice versa*.

Explanation of Plates XI to XIII.

PLATE XI.

- Fig. 1. Stone axe, of hard clay slate, found near Timiong, about two days' journey north-east of Kending Kintah.
„ 2. Sakai *belantay*, or spear-trap for large game, as used in Ulu Kintah.
„ 3. *Belantay* of the Perak and Kintah Malays.
„ 4. Section of a Sakai fish-trap on the Kintah River.

PLATE XII.

- Fig. 1. Section of a Sakai house at Gunong Goumpi, north-east of Kending Kintah.
„ 2. Plan of a Sakai house at the top of Gunong Goumpi.

PLATE XIII.

- Figs. 1 and 2. Ornamental wooden hair-combs, used by the Sakais in the mountains north of Kending Kintah.
„ 3 and 4. Ornamented bamboo pins for disentangling the hair, used by the Sakais north of Kending Kintah.

ETHNOLOGICAL NOTES *on the* ASTRONOMICAL CUSTOMS *and* RELIGIOUS IDEAS *of the* CHOKITAPIA *or* BLACKFEET INDIANS. CANADA. By JEAN L'HEUREUX, M.A., Interpreter.

[WITH PLATE XIV.]

SABIANISM has been the primitive mode of worship of the Chokitapia. They know and observe the Pleiades, and regulate their most important feast by those stars. About the first and the last days of the occultation of the Pleiades there is a sacred feast amongst the Blackfeet. The mode of observance is national, the whole of the tribe turning out for the celebration of its rites, which include two sacred vigils, the solemn blessing and planting

of the seed. It is the opening of the agricultural season. The rites celebrated remind one of the Hebrew Passover, and some of the mysteries held by the Ancients in honour of Ceres.

The Blackfeet call the Pleiades the seven one (*Ekit-si-kuno*), but as the root-word for perfect or perfection is contained in the word, the meaning is "the seven perfect ones."

In all highly religious feasts the calumet, or pipe, is always presented toward the Pleiades, with invocation for life-giving goods. The women swear by the Pleiades as the men do by the sun or the morning star.

The feast of *Innis-si-man* at the disappearance, and the *Mon-toke*, feast of the women at the reappearance, marked amongst the Blackfeet the period of occultation of the Pleiades. *Innis-si-man* means "the grave" or "the burying of the seed"; *Mon-toke*, "the meeting of the absent one." Both feasts are lost in the antiquity of Indian traditional lore.

On the last day of the occultation there is a women festival, called the *Manis-tam*, or flag-pole dance. These rites are very ancient, and of Toltec origin. The women that take part in it are all Vestals of the Sun, and are the same class of women who alone figure in the sacred feasts of the nation. At the feast of *Ocan* they preside over the presents to be distributed to the warriors.

Ocan, from the Aztec word *ocal*, a building, is the feast of building or harvest, or storing in the crop. It is celebrated sometimes in October, and always accompanied by the feast of the dead, which feast is not only tribal, but confined to kindred race. It is called *Sta-pas-can*, "the dance of the dead," and is of Aztec origin. It begins at sunset, and ends at daylight.

In time of scarcity of food, seven vestals of the sun dance alone in a circle, invoking the starry heaven for food for the needy. It is always a nightly dance, and kept up for seven nights' duration.

Emita-stok-sis, "dog-face," is Sirius; *Magsi-satis*, "hunter-belt," the belt of Orion; *Sta-mixe-tomo*, "the Bull of the Hills," Hyades. The milky way is called *Makoye-osokoy*, or "the wolf way." The Chokitapia have inherited from their ancestors twenty groups of constellations, which are their zodiacal signs.

The Blackfeet have seven classes of warriors, dividing the stage of initiation to the mysteries into three degrees. All medicine men must be initiated into those three degrees. Their ordeals are mostly connected with number three, seven, or ten. They have passes and signs known only to the initiated. In the incantation of the medicine men many words not belonging to their language are used; some of them appear to me Sanscrit words.

The triangle (*Copan*) is a sacred symbol. It is called the arrowhead of the great hunter, Bull of the Hills (*Orion*). The earrings of the medicine men are made of shell from the Pacific in form of a triangle. (Plate XIV, fig. 1.)

In the religious purification of the medicine men, a hole in the form of a triangle is dug in the ground, seven heated stones are thrown into it, and cold water poured over them for a vapour bath. When thus bathing, invocation is made to the Pleiades, for assistance in curing bodily disease. Seven brass ball buttons are worn by them as a talisman against fever.

The **T**, or tau cross, is a sacred symbol used in the consecration of medicine men. It is painted in blue upon the breast of the newly initiated as a sign of power. It is connected with the gift of healing.

The Blackfeet believe the number three the lucky one, four a bad one, and seven and hundred are perfect numbers.

The sacred dance of the *Ma-tie* class of warriors for the general meeting of all the clans of the nation is supposed to represent the celestial dance of the seven young men personified by the Pleiades above. They are called the Crow, the Partridge, the Eagle, the Owl, the Crane, and the Yellow or Golden Bird, also named *Pokina*, or Chief Bird, who was the leader. They were all brothers, and nightly guard the field of the sacred seed. To keep sleep away in the long hours of night they were dancing around the field. Episors, or the Morning Star, was so pleased with them that he caused them to be transported into heaven, so as to rejoice all the stars by their perpetual dance.

Numerous traces of the Mayal Toltecs' or Nahuas' cosmogony and religious belief are found amongst the Chokitapia. The third Napa, or great prophet of the third age (Natose, or the third Sun of the World), is supposed to be buried in their country in a large pyramidal mound on the Bow River, about seventy miles east of Blackfoot Crossing. It is a graded mound that has not yet been opened. Five years ago a stone tablet with the engraved figure of the sun, with seven arms and hands upon it, was found in the vicinity. (See Plate XIV, fig. 2.)

Close to mounds or tunnels for religious purposes, you will often see the figure of a man with extended arms; from one hand so extended to the other is a circle of loose limestone, passing above the head of the figure. (Plate XIV, fig. 3.)

The legend of Coes-sa in the second sun or age of the world stated that the second Napa replaced all the misplaced members of their bodies, and taught them the way to use them aright.

The Hades of the Chokitapia is said to be situated in the great waters where the sun sets and where is the God, a

mysterious island in the Pacific where there are many sandy hills. They have no Hell, but only Paradise, in their Hades. They all expect to go there after death. *Spatikoy-etapo* is the word used by them to say to a dead person, "He is off for the sandy hills."

The Thunderer is supposed to be an immense bird with green feathers; the lightning he produces with the fire of his eyes, and the thunder by the noise of his wings. His return, on the spring of the year, is celebrated with rejoicing and a sacred dance in his honour. He is supposed to grant to the warriors the gift of invisibility in the fight.

Explanation of Plate XIV.

- Fig. 1. Earrings of shell, worn by the medicine men among the Blackfeet Indians.
 „ 2. Stone Tablet, with engraved figure of the seven-armed sun, found near Bow River.
 „ 3. Figure of man with extended arms, found near an ancient tumulus of the Blackfeet Indians.

On the PRIMARY DIVISIONS and GEOGRAPHICAL DISTRIBUTION of MANKIND. By JAMES DALLAS, F.L.S., Curator of the Albert Memorial Museum, Exeter.

THE number of divisions into which it has been proposed to separate mankind has varied from two to sixteen, and even to sixty, but on geographical as well as upon anthropological grounds it appears to me that not more than three great groups can be satisfactorily maintained. These primary groups I would propose to name and characterise as follows:—

Leucochroi, represented by the European, in which the skull is variable in form, the face orthognathous, eyes blue to grey, with the sclerotic clear and white, the skin fair; the hair varies from yellow to brown, and presents a more or less oval form in section, and the nose is leptorrhine.

Mesochroi, represented by the Mongols and American Indians, in which the skull is also variable in form, the face eurygnathous, the eyes dark to black, the skin yellow-brown to olive, the hair coarse, straight, and black, and presents in section an almost complete circle, and the nose (except in the Eskimo) is mesorrhine.

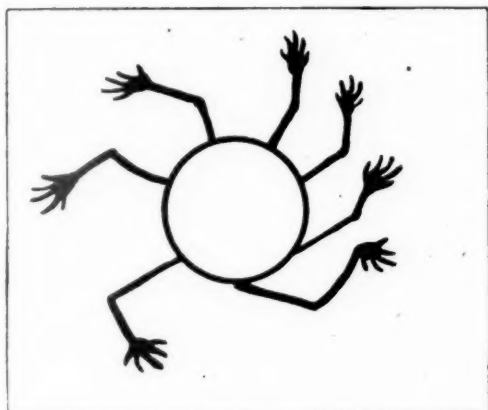
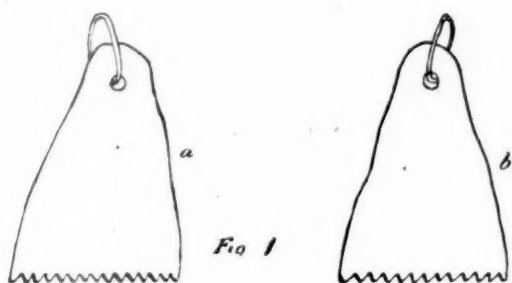


Fig. 2.

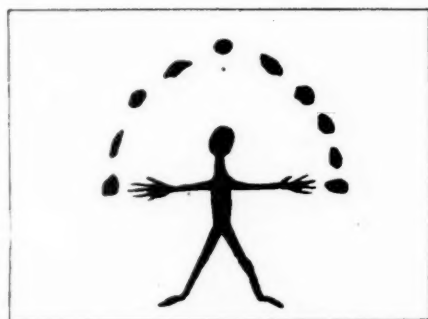
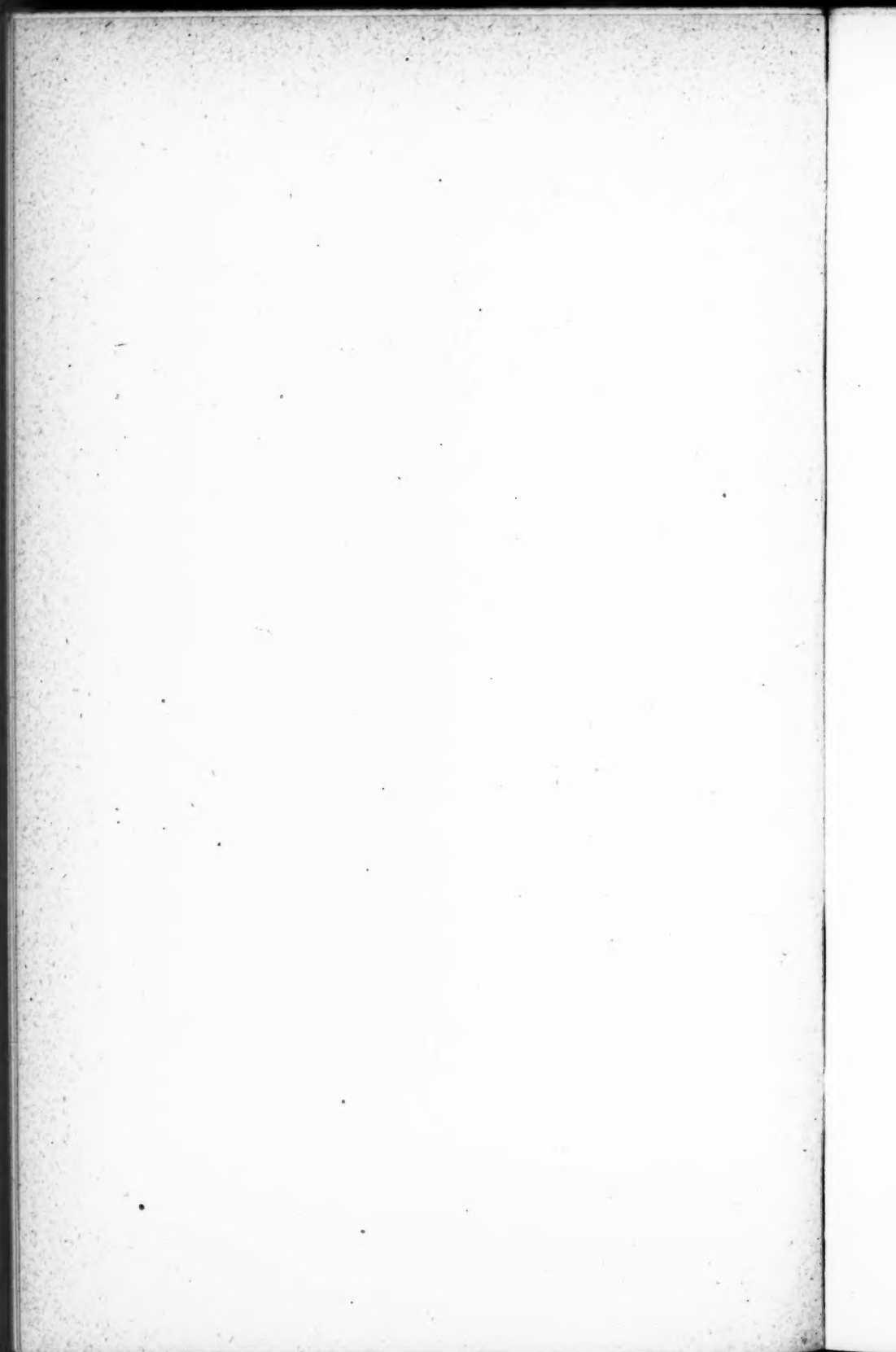


Fig. 3.



Æthochroi, represented by the Negroes and the Australians, in which the skull is dolichocephalic, the face prognathous, the eyes dark to black, and the sclerotic discoloured, the skin yellow-brown to black, the hair black and woolly to wavy, and presenting a flattened ellipse in section, and the nose is platyrrhine.

In this classification I have ventured to differ from Professor Huxley¹ in so far as I have omitted his Australoid group, while from the views of another school of ethnologists² I have been led to dissent, in that I have considered there were sufficient grounds for the retention of a Mesochroic group, more or less equivalent to Professor Huxley's Mongoloid division. The names which I have employed seem to me more desirable than geographical terms, which tend to prejudge the question of distribution.

Æthochroi.³—Anthropologists are, I think, agreed that the inhabitants of Africa, south of the Sahara, present characters which indubitably associate them in one great group, notwithstanding the many varieties which they exhibit in some of their features. But it has been affirmed, sometimes doubtfully, sometimes with great confidence, that the Negro type is not to be traced in North Africa, or at all events only appears in such an insignificant degree as to be scarcely worthy of attention, in considering the distribution of the group. I confess I cannot see that the evidence before us is sufficient to warrant the retention of this view. On the contrary, many points serve to prove the *Æthochroic* origin of the people inhabiting the Mediterranean and Red Sea shores of North-East Africa, though I am far indeed from affirming that this origin is purely *Æthochroic*.

The principal peoples with which we are concerned are the Berbers and the Nubians. At least if we can obtain satisfactory evidence of the origin of these races, it will afford *primâ facie* evidence of the origin of allied North African nations.

Though the Berbers differ in many important respects from the true Negro, yet there are points so well marked in their physical aspect, that Prichard⁴ says—"the most interesting fact connected with this race is that they appear, if we may place reliance on historical evidence, to furnish an instance of the transition from the physical character of the Negro to one very

¹ Huxley (T. H.), Trans. Internat. Congr. Prehist. Archæol., Sess. 3 (1868), p. 92.

² Murray (A.), "Geogr. Distrib. Mammals" (1866), pp. 56 *et seq.*

³ This word has been substituted for *Melanochroi*, in order to avoid confusion with Professor Huxley's *Melanochroi*.

⁴ Prichard (J. C.), "Nat. Hist. Man," 3rd edition (1848), p. 274.

similar to that of the ancient Egyptians." Nevertheless, the physical characters of the Berber, doubtless at the present day largely influenced by admixture with Arab blood, leave us in great doubt as to the origin of the race, and perhaps from facial and craniometrical characters we are hardly justified in assuming more than that degree of Negroid influence which close proximity would readily account for.

Included in the Berber tribes are the Libyans and the Nubians, whose African origin is hardly disputed, though the woolly hair of the *Æthiochroic* group gives place to hair which is generally described, not as woolly, but as "crisped," and this crisped hair is to be found, more or less, amongst all the North African peoples. Moreover, the Berbers of the Higher Atlas are stated to differ entirely from the Arabs and Moors, and it has been claimed for them that they represent the aboriginal inhabitants of the country; while the Shuluh tribes of the Northern Atlas have been satisfactorily proved to belong to the same group, the two languages being unquestionably cognate dialects. If then it can be maintained that these Berbers are neither Arabs nor Moors, we are surely justified in classing them with the true African races, with which their physical characters in many respects connect them; but there still appears to be an element in this Berber race which cannot be satisfactorily determined, though the "aboriginal" theory does not deserve to be entirely ignored.

It must not from the foregoing remarks be supposed that I wish to maintain the *pure* *Æthiochroic* origin of these North African races, my desire being simply to prove that a Negro race has in a very marked degree affected their character; so much so, indeed, as to warrant our supposing that a part at least of this region was once inhabited by the black races. And so with their near neighbours, the Nubians of the Red Sea and those of the Nile, who are described as dark, almost black in colour, and possessing hair which is frequently crisped and thick, and has sometimes even been observed to be woolly, its appearance giving rise to a comparison with that of the Negroes of Guinea, from which, however, it is said in some unexplained manner to differ.

Finally, it has been remarked by Prichard,¹ and confirmed by many later writers, that though the typical woolly hair is generally associated with the Negro of Africa, yet, "if we take the entire mass of the black native races of Africa into comparison, we shall find tribes amongst them who, similar in complexion and in most other physical peculiarities, yet differ in regard to

¹ Prichard (J. C.), "Nat. Hist. Man," 3rd edition (1848), p. 99.

their hair, and present every possible gradation, from a completely crisp, or what is termed woolly hair, to merely curled and even to flowing hair." Hence we may, I think, fairly assume that though the woolly hair regarded as typical of the African Negro may be taken as evidence of the *Æthochroic* origin of the races in which this peculiarity is remarked, yet its absence can hardly justify us in rejecting from the *Æthochroic* group such races as, but for this characteristic, possess unmistakable Negro features, whether of face or form.

The foregoing facts present us, I think, with evidence sufficient to prove that at some time since Africa was first populated by man an intimate relation existed between the southern portion of the continent and the north-eastern border, and that throughout Abyssinia, Nubia, and Egypt extended a branch of that *Æthochroic* group of which the African Negro is the best available example.

Concerning the existence of the *Æthochroic* group in Arabia, I have hitherto been unable to find any very conclusive evidence, yet indications are not wanting of an African type in that country. M. de Pagés affirms that the Arabs inhabiting the middle of Arabia "have the locks somewhat crisped, extremely fine, and approaching the woolly hair of the Negro," while Mr. Palgrave,¹ though he expresses himself as strongly opposed to the notion that the Omanees, or indeed any "of the Khatanee stock, of which they are perhaps the most authentic representatives," have anything in common with the Negro, yet emphatically pronounces them to "belong to the African Abyssinian family," and conjectures that they "migrated at an early period into Arabia from the West, across the Straits of Bab-el-Mandeb."

It is, however, quite as probable, it seems to me, that they are a remnant of the *Æthochroic* group which formerly occupied the whole region, and that the sea-barrier which now separates Africa from the Arabian peninsula did not formerly exist. There is, I confess, no evidence in support of this, as opposed to the view maintained by Mr. Palgrave, but the Arabs are not generally regarded as very tolerant of foreign intruders, and the prospects of a small incursive tribe of Africans would probably be anything but hopeful in their midst. Supposing them, however, to have been the original possessors of the soil, we may well conceive that, though driven back from the more fertile tracts, they might still preserve a precarious existence in the interior, and in process of time, and by an almost imperceptible mixture of blood, acquire so much of the Arab character that their original African or rather *Æthochroic* descent would be

¹ Palgrave (W. G.), quoted by Murray (A.), "*Geogr. Distrib. Mammals*" (1866), p. 412.

ignored or even forgotten by their Arab neighbours. I do not, however, regard as of great moment the present existence of the *Æthochroic* type in Arabia, for even admitting its presence we have still an enormous gap existing between this and the nearest Eastern appearance of the *Æthochroic* group in India.

That in the mountains of the Dekkan certain black races existed, which could be referred to none of the civilised races of Hindustan, has long been known, but the information which has been gathered together on this point is far from complete, and perhaps the difficulty of referring them to any other race first induced anthropologists to look to Africa or to Australia for their nearest allies. The best known of these tribes are the Kulis, the Bhils, the Gonds, and the Konds, all of whom seem to be characterised by the large mouth, the thick, more or less protuberant lips, the broad, compressed nose, and the high cheek-bones which are seen in the Negro races. The skin is generally black, or nearly so, though this is not by any means a fixed character. The hair is also black, but has never been stated with certainty to present the woolly character of the Negro; but I would mention that to the best of my belief I have myself seen natives of India with unquestionably woolly hair. The reiteration of the contrary statement has, however, so unsettled my mind on the subject that I should now be loth to pronounce with certainty upon so simple a question. I hope, however, shortly to obtain evidence on this point which may be conclusive.

Of one of these Indian black races, inhabiting the Nalla Malla, or Black Mountains, Captain Newbold has stated that they have long bushy hair, thick lips, and high cheek-bones; but this is not a very accurate description, and though it would not apply to the ordinary Hindu, yet would not justify our referring the race to the *Æthochroic* group. There is, I think, an element of uncertainty introduced into the discussion of the characters of the hill-tribes of India in consequence of the use of this term "hill-tribes." Thus Major-General Briggs, in his report, includes the Kukis, Garos, Khasias, and apparently the other tribes of the Assam Hills amongst the hill-tribes of India, and herein he is unquestionably in the right. But there could be no greater racial difference than exists between the hill-tribes of Assam and those of the Dekkan, the former being, in feature, language, and manners, of undoubted Mongolian origin,¹ and when, therefore, an attempt is made to generalise the descriptions of the hill-tribes as parts of a whole, serious error is un-

¹ The tribes to which I especially refer are the Kukis, Nagas, Khasias, Garos, Luchais, Kacharis, and Manipuris, all of whom I have frequently come in contact with.

avoidable. Unfortunately, Professor Huxley has regarded the Dekkan tribes as other than of *Æthochroic* origin, or rather as differing essentially from the African Negro. As, however, he has included them in his *Australioid* division, I do not, as will be presently seen, regard this as a serious difference of opinion, inasmuch as there seems to be no reason to separate the Australians from the remainder of the *Æthochroic* group.

Extending to the eastward of India, similar races are said to be, or to have been present in Burma, Siam, Cochin China, and China,¹ but beyond simple assertion I have been able to obtain little evidence of the correctness of the statement, which, however, on *primâ facie* grounds, we have no reason to doubt.

Of the affinities of the Mincopies of the Andaman Islands there is no doubt. Professor Huxley and Sir Richard Owen, amongst others, express themselves very strongly as to the "Negroid" origin of the Mincopies, and this alone being granted would be sufficient upon which to found the theory that they had also at one time occupied the mainland, or at least land which had formerly an extension both towards Africa and towards the Philippines and other Pacific Islands. The physical characters of the Andamanese are essentially *Æthochroic*, though there are points of divergence, and these are, some of them, of remarkable persistency. There is amongst the Mincopies a singular uniformity of type, the variations which can be observed in individuals being extraordinarily small. And the type agrees in most essential points with Professor Huxley's Negroid division. The skull is indeed brachycephalic, but not in an extreme degree, the index being given as 81·87. This is obviously against the *Æthochroic* origin of the race; yet we must not forget that equal variation is to be observed in true Negroes.

To the south-east of the Andamans, in the Malay peninsula, the *Æthochroi* unquestionably appear, as is indeed generally admitted by ethnologists, whatever may be their views concerning the affinities of the nations still more to the south. According to Professor Huxley the group occupies, besides the Andamans, the Malacca peninsula; the Philippines and the islands of the eastern part of the Malay archipelago; are again found in New Guinea; and thence stretch as far as the Fijis; and are finally to be identified in Tasmania. Unfortunately there exists some diversity of opinion concerning the affinities of the black races of Oceania, though the prevailing view appears to be in favour of their unity of origin.

Mr. Wallace,² who had, however, no opportunity of himself

¹ Murray (A.), "Geogr. Distrib. Mammals" (1866), p. 66.

² Wallace (A. R.), "Trans. Ethnol. Soc. Lond.," vol. iii (1865), p. 209.

examining them, affirms that between the Negritos and Samangs of the Philippines and the Malay archipelago, and the Papuans, there is "no affinity or resemblance whatever." He states, however, that "the hair of these dwarfish races agrees with that of the Papuans, but so it does with that of the Negro of Africa. The *Negritos* and the *Samangs* agree very closely in physical characteristics with each other and with the Andaman Islanders, while they differ in a most marked manner from every Papuan race." Notwithstanding the difference which exists, the Papuans must still, I think, be referred to the *Æthochroic* group. They possess the frizzled hair of the Negro races; the skin is of a colour "approaching but never quite equalling the jet-black of some Negro races;" the limbs in their length and tenuity resemble those of the Negro; the hands and feet are large; the mouth is large, and the lips are thick and protuberant. The nose, however, is anything but Negroid in form. Mr. Wallace describes it as "large, rather arched and high, the base thick, the nostrils broad with the aperture hidden, owing to the tip of the nose being elongated." Thus in Mr. Wallace's description the only character which does not, more or less, agree with the *Æthochroic* type is the nose, and even this in the skull would probably not differ greatly, if at all, from the nasal bones of the Negro, the nasal index in the black races of Oceania generally being even greater than in the Negroes of Africa.

Whatever may be the Papuans—and there can, I think, be little doubt that they are essentially *Æthochroic*, notwithstanding the nasal difficulty—the existence of *Æthochroic* races in the other islands of Oceania and in the Malay peninsula is certain.

The so-called Pelagian Negroes are stated by Prichard¹ to "have short crisp or woolly hair, and bear altogether a considerable resemblance to the Negroes of Africa;" these are typically referred to the Philippine Islands, but they are scattered throughout the whole area, differing to a greater or less extent from the true Negro, but yet presenting us with an aggregation of characters sufficient to justify our placing them with confidence in one and the same group. It must, however, be understood that I do not claim for any of the Oceanic races absolute purity of blood, though the admixture, if it exists, need not be very great.

Finally, we have to consider the inhabitants of the Australian continent, concerning whom there is not a little difference of opinion. Professor Huxley has regarded them as differing to such an extent from the nations around them, that he has

¹ Prichard (J. C.), "Nat. Hist. Man.," 3rd edition (1848), p. 22.

constituted them a group alone—a group to which he attributes a singular extension. Occupying only the continent of Australia in the south, he identifies with them the black races of the Dekkan, and perhaps those of Abyssinia and Egypt, while he suggests a possible extension through Western Asia, and along the two shores of the Mediterranean.

Mr. Oldfield,¹ in his account of the "Aborigines" of Australia states that there "can be little doubt that the New Hollanders are mainly of Malay descent, the physiognomy of Malays and Australians being essentially the same. . . . But although the Alfouira must be considered principally of Malay origin, it seems probable that there has been a mixture of Negro blood." This is, I think, exactly the reverse of the truth.

There are some striking characters which serve to bring together the Negro inhabitants of Africa and the "Negroid" and other races of Australia and the Negrito Islands. The skull is in both cases markedly dolichocephalic. Thus the cephalic index of a group of Australians was found to be 71.49;² of a group of New Caledonians 71.78, and of a group of Hottentots, Kaffirs, Bushmen, and "Negroes," 72.78. These figures place them at the very summit of the dolichocephalic races, the only people approaching them being the Eskimos, with an index of 71.71.

M. Broca has also attached great importance to the nasal index, that is, the proportion of the breadth to the length of the anterior nasal orifice—a character which, in some of its developments, has been regarded as indicating a transition between man and the apes. The figures in M. Broca's tables of this index vary from 72.22 to 35.71, and these forms he divides into three groups: the mesorrhines, including the indices between 48 and 52; the platyrrhines, including those from 53 upwards, and the leptorrhines, including those from 49 downwards. Thus separated we find that the white races (*Leucochroic* group) are leptorrhines; the Mongols and Americans (*Mesochroic* group), with the exception of the anomalous Eskimos (42.33), mesorrhine; and the black races (*Æthochroic* group) platyrrhine. This general agreement is the more interesting when it is remembered that M. Broca regarded the nasal index as one of the safest racial tests. Certain tables of this measurement show that the nasal index of Negroes and other African races is 55.44; of Tasmanians, Australians, and New Caledonians, 54.66; while that of a number of Mongolians and Americans ranged between (Japanese) 51.47 and (Eskimos) 42.33.

The question of language is one which of course in an area of

¹ Oldfield (A.), "Trans. Ethnol. Soc., Lond.," vol. iii (1865), p. 215.

² Broca (P.), "Rev. d'Anthrop.," vol. i (1872), p. 385.

this kind deserves special attention. An eminent authority has thus pronounced upon this subject:¹ "Whatever the Papuan and Australian languages may be like, or unlike, they are more like one another than aught else; they are also more like the Malay and Polynesian, however little or great that likeness may be. . . . And in like manner, whether the likeness be little or much, the Malay languages are liker to the southern members of the monosyllabic class than to any other forms of speech." The arguments by which Dr. Latham supports this view are not here required, but if not conclusive, they appear at least to be cogent, and should not be rejected, except upon the strongest grounds. I have quoted this passage in support of the view I entertain, that in the Oceanic area the language has been influenced to a large extent by contact, but not to a large extent by admixture with the Malay races; but this question will be again referred to hereafter.

From the researches of Sir George Grey² and others, there can be no doubt as to the practical unity of the Australian dialects, for the recurrence of the same words with the same signification can "be traced, in many instances, round the entire continent, but undergoing, of course, in so vast an extent of country, various modifications." Further, he remarks that the same names of natives occur frequently at totally opposite portions of the continent, and from the fact that the natives name their children from any remarkable circumstance which may occur soon after their birth, he concludes that the "accordance of the names of natives is a proof of similarity of dialect." It has occurred to me that the slight change which thus appears to have taken place in the language of widely separated tribes may be due, to no small extent, to the peculiar marriage laws which exist throughout the continent, which themselves may be regarded as an argument in favour of the original unity of the stock, were any argument needed beyond physical structure.

In support of the view that the Negroes of Africa are related by language to the Australians, Mr. Murray³ instances the fact first noticed by Mr. Earl, that in the "Croker Island dialect a cluck occasionally occurs in the middle of a word, which is effected by striking the tongue against the roof of the mouth." This peculiarity is also characteristic of some of the South African tribes, and notably of the Zulus, but whether it can be regarded as proving any, even the most remote connection between the two peoples it would be rash to decide.

¹ Latham (R. G.), "Elements of Comp. Philology" (1862), p. 370.

² Grey (Sir G.), "Journals of two Expeditions of Discovery in North-West and Western Australia" (1841), vol. ii, pp. 208 *et seq.*

³ Murray, (A.), "Geogr. Distrib. Mammals" (1866), p. 61.

As regards physiological characters, the singular change which occurs in the colour of the skin, hair, and eyes in African Negro children is well known, and it is interesting to observe that the "children of the Australians¹ immediately after birth are yellowish brown, and become dark at a later age," so that throughout the black and dark-coloured races there appears to be a tendency on the part of the children to display a somewhat lighter hue than that of the parents.

Having now glanced rapidly at the characters of the people whom I regard as possessing unquestionable *Æthochroic* affinities, it is necessary to consider the area in which they occur. I do not, however, wish it to be supposed that I desire to fix the starting place of the black races, which I think is a matter of little consequence in considering their distribution. We have seen that indications of races which may be classed in the *Æthochroic* group exist in South Africa, in Egypt and Nubia, in Arabia, in India, in the Andaman Islands, and the Malay peninsula, in the islands of Oceania and in Australia, while there is some evidence of their extension to Cochin China. The changes in physical geography requisite to bring all these places into communication are far from great. An elevation of only one hundred fathoms would join into one extended peninsula all the islands from Cochin China to Java, including Borneo; New Guinea would be joined to Australia, and the narrow seas which would exist between the remaining islands would offer no great barrier to the migration of man, even when his means of ocean transit were of a very primitive order. A yet greater elevation, but still one of no very great extent, geologically considered, would convert the greater part of the Bay of Bengal into dry land, and join the Andamans by a land passage to India; while an equal rise to the west would join India and the Laccadive and Maldivé Islands to Arabia, converting the Arabian Sea into a broad expanse of nearly level ground. And an elevation of less than a thousand feet would obliterate the barrier formed by the Red Sea between Arabia and Eastern Africa. All these imaginary changes are as nothing compared to the changes which we know to have occurred in the levels of land surfaces, and they are sufficient to account for the easy migration of a race located in any part of the area.

But we have also to consider the limitations of the *Æthochroic* group. In the south, both in the African and Australian regions, its extension is interrupted only by the open ocean, but on the north the land is continuous; yet it is easy to fix boundaries beyond which the group has *not* extended. And these boundaries agree in a remarkable manner with the natural

¹ Darwin (C. R.), "Descent of Man," 2nd edition (1875), p. 557.

boundaries which either exist at the present, or which we have excellent grounds for believing have formerly existed. From the Cape de Verde to the neighbourhood of the Nile probably extended a no longer existing sea, cutting off from Southern Africa the whole of Barbary, but still leaving the communication open between Abyssinia and Egypt, and the supposed south-western extension of Arabia. Thus Europe would be effectually separated from Africa, except at one point—the Dardanelles. And of what nature the barrier at this point could be, it is difficult to decide. Possibly the Mediterranean and the Black Sea may have been continuous, instead of being joined only by a narrow strait; or possibly again, the Taurus may, under different conditions, have offered a barrier greater than at present to the progress of man. This, however, appears to be the one break in the continuity of the northern barrier—a break which the geologist may be able to bridge over.

Between the Black Sea and the Caspian we have the Caucasus, offering probably, under other conditions, an impassable barrier, and thence, stretching from Armenia in the west, to near the source of the Oxus in the east, and cutting off from Northern Asia the tableland of Persia, is the chain of the Paropamisus. Whether, however, this was the retaining barrier, or whether the lesser heights of the Zagros Mountains, running from Armenia to the confines of Hindustan, were the original boundary of the *Æthochroic* group, I shall not attempt to decide. Neither would at the present offer an impenetrable barrier; but either might, under easily conceived changes of physical geography, become such a barrier. Thence we have the Suliman range and the great chain of the Himalayas; while eastward, either in Cochin China or in China, we find many possibilities, but no certainties. Possibly the Yellow Sea once covered the bed of the Yangtse Kiang, or of the Hoang-ho, when that and the Yun-ling chain would form an effectual barrier. At all events we are, I think, justified in assuming, from the present extension of the *Æthochroic* group, that the boundary was not placed northward of this point. Thus we have an area to no small extent demonstrably cut off from the northern regions of Asia and Europe, in which alone traces of the *Æthochroic* group are to be met with, and the *Æthochroic* peoples were, I believe, originally the sole occupiers of this area.

And I think that the distribution of the lower mammals over the area affords striking evidence in favour of this view, though some remarkable contradictions certainly occur.

In considering the question of the geographical distribution of other mammals, some allowance may be made for breaks of continuity in their range, which cannot be accounted for on

geographical grounds, and which therefore we may believe to be accidental. When, for instance, we see the Old World monkeys spread over Africa, the southern part of Arabia, India, Burma, China, and the Malay archipelago, it is reasonable to suppose that they must at one time at least have occupied a portion of Beluchistan, or of some land area continuous between Arabia and Hindustan. Let us then see what evidence is afforded upon the point by the geographical distribution of mammals¹ in the area in question.

First with regard to the highest order of the mammalia—the monkeys. The Catarrhine monkeys, as a whole, occupy the area which I have assigned to the *Æthochroic* races of man, with some important exceptions and differences. They are not to be found in Persia and Beluchistan, where the black races of man are also absent, and they are not to be found in Australia or New Guinea, or in the islands of Oceania (with some exceptions), south and east of Java, and the Celebes. Nor do they now occur in China north of the Yangtse-Kiang, but they are found in Japan and the neighbouring islands. I think from this we are justified in assuming that from Eastern Africa to Japan the Catarrhine monkeys formerly ranged without a break, and the hiatus in Persia, as well as that in China, we may allow to be due to accidental causes. Then we have to account for the sudden disappearance of the group beyond Java and the Celebes, and this I think may be easily done. We have seen that a peninsula probably formerly extended from Malacca and Cochin China to Java, and included just those islands which are now occupied by the Catarrhine monkeys, and I suppose that man, by means of rafts or boats, however rude, was able to pass the barrier presented by the narrow straits between island and island, while the same barriers would be absolutely insurmountable to the apes and monkeys. How to account for the distribution of the different groups of the Catarrhini, however, is less obvious. We find the anthropoid apes in West Africa, and in Borneo and Sumatra, but the passage across the Indian Ocean is indicated only by the presence of the gibbon, a doubtful anthropoid, in Assam and the neighbouring countries. Again, the baboons occupy South Africa and Arabia, and only appear again in the Philippines and Celebes. But at least they do not extend beyond the line which I have assumed to be the limit of the *Æthochroic* group of peoples.

The evidence afforded by the present distribution of the leopard is equally significant. Whether there is but one species,

¹ Murray (A.), "Geogr. Distrib. Mammals" (1866), *passim*. Nearly the whole of the facts of geographical distribution are derived from Mr. Murray's volume, although I have also availed myself of Mr. Wallace's work.

or whether there are two, or more, is a question still, I believe, undetermined, but the differences in the species described are so small that for the present purpose they may be safely ignored. We see then that the leopard extends over the whole of Africa, through Arabia, Asia Minor, Persia, and Beluchistan, to the Indian peninsula. Thence eastward it is found as far as China, and it extends southward to Borneo and Java, but is not found in the Celebes, or in the islands to the south and east. It occupies, then, just that area in which the *Æthochroic* group of peoples is found, with two exceptions. Australia and the islands to the north are without the leopard; North Africa, to which the black races did not probably *originally* extend, possesses it. Its absence in Australia and the islands may be explained on the same theory as the absence of the monkeys. Its presence in North Africa may reasonably be supposed to be due to a westward extension, subsequent to the elevation of the Saharan plateau, just as the marked Negro characters observable in the North African races may be attributed to a similar extension.

The evidence afforded by the civets and ichneumons is the same as that afforded by the leopard, except in so far as these extend into Spain and European Turkey, and beyond Borneo into New Guinea. Though no species seem to be common to the Indian and African areas, yet some of the genera are so.

The distribution of the jackals is precisely that of the leopard, except that there is an extension to the Celebes.

The otters afford by no means identical evidence, but while certain forms range between Western Africa and Borneo, with various breaks, it is to be observed that the common European species, *Lutra vulgaris*, does not, except in North Africa, extend south of the line which has been conjectured to define the original distribution of the *Æthochroi*. The distribution of the existing *Edentata* is identical with that of the Catarrhine monkeys, except that they are absent in Arabia, part of Western India, and Japan.

The rhinoceros is found in South Africa, in India, Siam, and Cochin China, and thence southward to Java; but in the fossil state it is found throughout Northern Asia and Europe, as well as in North America. But the fossil species nowhere extended south of the assumed *Æthochroic* barrier, and the existing species nowhere exist to the north of it, while the whole breadth of Central Asia and the Sahara separates the two areas. And I would here observe that it does not appear to me that our views concerning the distribution of man should generally be influenced by the distribution of fossil species of the lower mammals; for if we allow that man was the latest comer, we must admit that his

migrations, and, to some extent, the migrations of other existing creatures, would be influenced by the same causes, while anterior migrations of the lower mammals might have been influenced by an entirely different order of things.

Many instances might yet be given, tending to prove that at one time or another a barrier more or less complete has existed along the line already indicated, sufficient to oppose the passage of man and of the land mammals, though it must be admitted, on the other hand, that the distribution of some mammals is, at first sight at least, somewhat opposed to this view, and we are forced to infer, though the evidence is hardly conclusive, that the extension is due to alterations later or earlier than those which influenced the primary distribution of man.

I have now gone over the arguments in favour of the limitation which I have ventured to suggest of the original distribution of the *Æthiochroic* races, and I think I have shown that it is not only a possible but a probable limitation.

As regards the present purity of the *Æthiochroic* group I do not pretend to speak with any certainty, but I should suppose that in Africa is preserved one development of the pure black blood, while probably in the Philippines and some other of the eastern islands, and in the Andamans, another development, pure, or almost pure, still exists. In North Africa, in the islands of Oceania, and in Australia, we have probably certain results of crossing, more or less complex, but to this point I shall refer more particularly hereafter, when I come to discuss, more briefly I hope, the distribution of the two remaining groups.

Leucochroi.—The races included in this group are for the most part recognised by all ethnologists, and it is therefore needless to enter at great length into a discussion of their characters. That there are, however, remarkable divergences amongst many of these races is evident, but these have by Prichard¹ been explained away by "reference to climate, and to diversity of food and manners." Whether such influences alone could have produced variations so remarkable is, I think, more than doubtful, for the nations forming the group to which the unfortunate term "Caucasian" has been applied, have probably in the progress of ages undergone greater changes, due both to local conditions, and, I should imagine, to more or less complex crossing, than those of either of the other groups, and in it we are now forced to include such widely divergent types as the Hindu, the Circassian, the Jew, the Arab, and the European. And these types it is impossible to separate by any line which can be deemed satisfactory, though the typical characters of each are so well marked that it

¹ Prichard (J. C.), "Nat. Hist. Man," 3rd edition (1848), p. 139.

is easy to separate them into tolerably definite and homogeneous nations. With these minor divisions we have, however, nothing to do, so long as we admit that a white group exists, equivalent in value to the *Æthochroic* group already discussed, and this is, I think, generally admitted by all ethnologists.

The present distribution of the *Leucochroi* is also, I think, an undisputed question—at least it is, in its broader aspect, sufficiently so to render any lengthy discussion unnecessary. I assume the white European to be typical of the group, as it at present exists, though every intermediate hue, almost to the blackness of the Negro, is to be met with.

Roughly speaking, the *Leucochroic* group occupies the whole of Europe, with the exception of a part of the northern portion, and certain indefinite areas such as Hungary and parts of Russia, but that it was the original population of this region is, I think, more than doubtful.

To the eastward of the European area we find undoubted *Leucochroic* peoples upon the western slopes of the Caucasus, in Armenia, in Persia, in Georgia and Circassia, in Afghanistan, in Kashmir, and in Hindustan. Further, we find that at Kattiwar, in Northern India, and in Rajputana, the natives frequently have light hair and blue eyes, and present unquestionably the typical *Leucochroic* characters. To the northward, again, beyond the Himalayas, in the Hindu Kush, or, as it is called, the Indian Caucasus, is another tribe of *Leucochroic* people, the *Siah Posh Kafirs*, retaining their Sanscrit language, or at least a language cognate to the Sanscrit, and presenting characters of feature and complexion comparable to those of the fairest of Europeans. Though various origins have been proposed for these tribes, such as Arab, Hindu, and Zoroastrian, yet Dr. Leitner,¹ who has devoted immense labour to their history, regards them as the aborigines of the country, and considers "that if they are not the ancestors of our Aryan race, they are certainly in an equal relationship, as far as languages go, with the Sanscrit." Further, in China, it was noticed, so long ago as the time of Macartney's Embassy, that a fair race of people, resembling Europeans, was located upon the banks of the Amour, who were nevertheless regarded as Tartars. In his account of his journey, Sir John Barrow² says that amongst the *Man-tchu* Tartars he observed "several, both men and women, that were extremely fair and of florid complexions; some had light blue eyes, straight or aquiline noses, brown hair, immense bushy beards, and had much more the appearance of Greeks than of Tartars." He further describes

¹ Leitner (G. W.), "The *Siah Posh Kafirs*" ("Journ. Anthropol. Inst.," vol. iii (1874), p. 356).

² Barrow (J.), "Travels in China" (1804), p. 185.

the language as full and sonorous, and "more like the Greek than any of the Oriental languages. . . . It is alphabetic, or, more properly speaking, syllabic, and the different parts of speech are susceptible of expressing number, case, gender, time, modes of action, passion, and other accidents, similar to those of European languages."¹ Yet it does not appear to have occurred to ethnologists until long afterwards that these people were a remnant of the so-called "Caucasian" races still occupying a portion of the original home of their ancestors, though, indeed, a Greek origin has been attributed to them, notwithstanding all the difficulties of physical geography, and the geographical distribution of other races. Nor, perhaps, with the time-honoured theory of the West Asian origin of the Leucochroic group ever before them, can we be surprised that ethnologists should hesitate to regard them as a still surviving outlier of that group.

Of these people there seems to be but a remnant, and another remnant is apparently to be met with in the south-east of China. To the west of the kingdom of China, however, we have historic evidence of the existence of a nation presenting us with some characters which may be identified as belonging to the Leucochroic peoples. The kingdom of Woo-sun, occupying apparently the modern province of Ili, to the east of Lake Issikul, contained a population of no less than 630,000 persons (207 B.C. to 9 A.D.), who are described as having blue eyes and red beards, and who in their manner and customs certainly present a marked contrast to the Chinese. It might of course be argued that these people had migrated from the west towards the confines of China, but that we are told² that the "nation was originally settled, together with the Ta Yuě-she between the Tun-hwang and China," so that it is clear they had migrated from east to west, and not from west to east.

Another and most important indication of the presence of the Leucochroic group in this region is to be found in the island of Yeso, in the immediate vicinity of the Amour River. The Aino of Yeso, and other of the islands to the north of Japan, have frequently been referred to the same type as the Japanese, and though until lately little appears to have been certainly known regarding the structure or the vocabulary of their language, yet what was known was doubtfully referred also to the Japanese family of languages. There seems now, however, to be no doubt that the language at least of the Aino has not the slightest affinities with the languages of the neighbouring Mongolian races, and indeed appears to have few affinities with any known language.

¹ *Ibid.*, p. 270.

² Wylie (A.), "Notes on the Western Regions" ("Journ. Anthropol. Inst.," vol. xi (1882), p. 84).

Nevertheless it has been stated by Klaproth that there is not a little connection between the language of the Aino and that of some of the Samoiedes, as well as between these and some of the dialects of certain Caucasian tribes; but what this connection is worth I cannot say. That the Aino language is, however, of a remarkably primitive type seems to be generally admitted by philologists, and the want of traceable affinities is therefore the less to be wondered at. Nor would it prove much were the Japanese elements far more pronounced than is in fact the case, for it would be by no means singular that a neighbour so near at hand, and so superior in culture, should during the course of centuries have influenced to some degree the language of an inferior and probably a defeated race.

The true affinities of the Aino are then to be sought in the physical characters alone, and these point conclusively to a Caucasian, or, as I should prefer to term it, a Leucochroic origin. Scheube¹ gives his opinion on this question as follows:—"I cannot discover the Mongolic type in the Ainos. The great development of the hair, the disposition of the eyes, the nasal formation, the moderate breadth between the cheek-bones, the absence of prognathism, are all so many traits separating them from the Mongolians." The evidence of other ethnologists upon this point is equally strong, and may be regarded as conclusive.

It has also been observed that people presenting striking Aino peculiarities have been detected at the extremity of Kamchatka, throughout the Kurile Islands, and in the neighbourhood of the Hingpu River and Castries Bay, near Sakhalin; while in a southerly direction they can be traced as far as the latitude of Tokio.² The descriptions indeed of the older writers are often very misleading, some affirming the Aino to be black, some dark, and some light copper-colour; but the "Caucasian" cast of countenance was very early recognised, and does not seem ever to have been disputed.

The foregoing facts have led me, after no little hesitation, to believe that the home of the Leucochroi is to be looked for, not in the neighbourhood of India or the Hindu Kush, or in the Caucasus, or in any western part of Asia, but in the very heart and centre of the area at present occupied by the typical Mongols.

The singularly isolated position of the great central plateau of Asia has been accurately described by Sir Richard Temple.³ It

¹ Scheube (B.), "Die Ainos" (1882), p. 3, quoted by Professor A. H. Keane in "Nature," vol. xxvi (1882), p. 525.

² Keane (A. H.), *loc. cit.*

³ Temple (R.), "Brit. Assoc. Report" (1882), p. 613.

is enclosed more or less completely by six great chains of mountains—the Himalayas, the Pamir, the Altai, the Yablonoi, the Yun-ling, and the Inshan and Khingan; and the altitude of these great chains is generally such as to render them quite impassable. But to the west, lying between the Altai and the Thian-Shan, is a detached depression, known as the Zungarian Strait, which is little more than 2000 feet above the sea-level. This depression, says Sir Richard Temple, "is geographically important as forming the only broad pass between our plateau and the world without. Great value was, in early times, attached by the Chinese to it, as being the only natural highway on a large scale between Northern and Central Asia." And in late historic times it was, as we know, by this path that Genghis Khan and his successors swarmed into Western Asia, and thence into Europe, until they reached at least as far as the confines of Hungary. On the north and on the south the barriers presented against the passage of man may be regarded as insurmountable, but in the east again, and especially "on the north-east, between Mongolia and China, there are several passes that have witnessed the historic outpourings of the Mongol hordes," and these passes were so practicable that they could never probably have presented any serious difficulties to the advance of incursive tribes.

Thus it is certain to demonstration that from the China Sea in the east, to the Caspian in the west, a road was open for the progress of man, which presented no insurmountable obstacles, but which has in fact been traversed by conquering hordes of Mongols, and we are therefore freed from the danger of error in assuming possibilities which might perhaps have no existence.

Whether the passes lying between the Khingan and the Yablonoi ranges, through which the Amour flows, are equally practicable, I have been unable to discover; but the mountains on the western frontier of Manchuria appear to be of no great height, and would not probably present any very serious barrier. I think it is then fair to assume that a race of people having access to the eastern coast of Asia might without difficulty have penetrated into the interior, and this being granted the physical formation of the district renders it impossible to assign a limit to their western extension. I believe, therefore, that the Leucochroic group of peoples formerly occupied the plateau of Central Asia, as defined above, and extended also along the eastern coast of Asia from Kamchatka on the north to the northward limitation of the *Æthochroi*, wherever that may have been, on the south. The islands of Japan, as well as those of Yeso and the Kuriles, seem also to have been populated by the Leucochroic; but we nowhere find indications of them south

of Eastern China, where their presence is by no means well ascertained, and we are therefore, as it seems to me, justified in affirming that the northern barrier of the *Æthochroi* formed the southern barrier of the *Leucochroi*.

From this region the *Leucochroic* races seem to have passed westward by the depression already referred to, south of the Altai range, and to have gradually overrun first Western Asia, and eventually nearly the whole of Europe, sometimes exterminating, sometimes mixing with the people already inhabiting the country. Though the main stream of migration doubtless followed the route which lay immediately before them, to the north of the Aral, the Caspian and the Black Seas, yet some doubtless penetrated southwards, and in very early times probably occupied the great tableland of Persia, and thence penetrated into the north of India, the traditions of the Hindus seeming to point to Afghanistan as the original dwelling-place of their ancestors.

As in considering the distribution of the *Æthochroic* group I availed myself of Mr. Murray's maps of the geographical distribution of mammals, so with regard to the distribution of the *Leucochroic* group I shall endeavour to prove that the boundaries which I have assumed are in fact natural boundaries, which have influenced the distribution of other animals as well as man.

The distribution of the true wolves represents very exactly the distribution which I assign to the *Leucochroic* group of peoples. On the north they extend from the most eastern extremity of Asia, in the neighbourhood of Kamchatka, to the northern coasts of Lapland, while on the south they range from Japan and the Corea in the east, northward of the Himalayas, into Persia, and thence, avoiding Arabia, but passing through Anatolia, they occupied the whole of Europe. That they extend far to the northward of the supposed *Leucochroic* area is obvious, but this I should be disposed to attribute to dispersal during comparatively recent times, though it must not be forgotten that the important boundary is the southern and not the northern one, and on the south the boundary is very much that which I have suggested. The main extension is to the north of the Caspian, though there is a minor extension into Persia, and thence westward to the Dardanelles, but nowhere does the wolf penetrate so far as Africa, and he does not even appear to have crossed the Pillars of Hercules. The presence of wolves in America I shall have to refer to when I come to discuss the remaining group. To the distribution of the common otter, *Lutra vulgaris*, I have already had occasion to refer. Though extending far to the north of the assumed *Leucochroic* boundary

in Asia, it does not, in any essential degree, penetrate to the south, being just indicated to the south of the Caspian and in Asia Minor. It, too, occupies the islands of Japan and the Kuriles. The sheep to some extent follow the same course. They are found in Eastern Asia from Kamchatka to the Corea. From Corea they follow the line of the Himalayas, and from the west extend into India. Thence they are found to the south and west of the Caspian, but they nowhere touch the shores of the Arabian Sea, and finally they are found in detached areas in the extreme west of Asia Minor, in European Turkey, in Corsica and Sardinia, and in the south of Spain. Though these belong to several species of the genus *Ovis*, they are all very nearly allied, and some question seems to have been entertained as to the specific distinction between some of them.

The distribution of the moles is also noteworthy. The European mole occupies the whole of Europe south of Finland, and in the south passes through Asia Minor, part of Persia, and Afghanistan, and is found throughout India south of the Ganges. Thence passing to the west and north of the Hindu Kush it extends to the north of the Altai range, and also through the great depression to the south of the Altai, already referred to, into the centre of the great Asiatic plateau. Here it seems suddenly to disappear, but its place is immediately taken by another, and very similar species, *Talpa wogara*, which extends to the eastern shores of Asia, between the mouth of the Amour on the north, and the Corea on the south, and occupies also the island of Yezo, while an almost identical species is found in Japan.

The distribution of the marmot affords evidence very similar to that afforded by the wolf. In Eastern Asia it stretches from Kamchatka in the north to the Corea in the south, passes to the northward of the Himalayas, thence passes through the western depression between the Altai and the Thian Shan, and so onward to the north of the Caspian, into Europe. The distribution of the marmot is the more interesting in that it occupies the whole of the Central Asian plateau, and though it passes to the north of the Leucochroic boundary, yet in the south nowhere encroaches upon the Æthochroic area, but directly extends, as I believe the main migration of the Leucochroic group extended, into the heart of Europe to the north of the Caspian.

My object in the foregoing remarks has been to show that in the migration of animals between Asia and Europe the general direction was through the Thian-Shan-Altai depression, and to the north of the Caspian. That there was generally also an extension in a northerly direction does not appear to me materially to affect the question, while the occasional extension

to the south, sometimes into India, sometimes into Persia and Afghanistan, may, I think, fairly be regarded as subordinate migration. The way in which the marmot penetrates to the eastern slopes of the Hindu Kush, and then as it were retraces its steps to exude at the great Altai pass so often mentioned, affords, I think, striking evidence of the definite character of the southern limit of the Leucochroic group up to this point. That many contradictory examples could be cited I do not for a moment deny or overlook. For instance, the jumping mice occupy North Africa and Arabia, and thence, passing through Persia and Afghanistan to the north of the Suliman range, find their way into our plateau. But I do not dispute the existence of practicable passes between Persia and the region drained by the Oxus, and only wish to maintain that the main passage, and the main stream of migration, both of man and beast, flowed through this pass, whether from the west or east, but more certainly from the east. That a road was also open from the Oxus valley into Persia and Afghanistan is indeed necessary to my theory; but it was, I believe, a road out of the usual track, and was followed only by detached tribes independently of the main exodus.

Of the purity of the Leucochroic group, as it at present exists, it is difficult to speak. The Aino, possibly, on the one hand, and the Scandinavian and German types of the European on the other, may be taken perhaps as examples of the group without much risk of error, though probably the Aino are to some extent crossed with the Mongols, and certainly some of the European and Western Asiatic nations show signs of an origin not purely Leucochroic.

Mesochroi.—The members of the remaining group are typically known as Mongols, but among them are also included the Eskimos and other inhabitants of the Arctic regions, and all the tribes and nations of North and South America. The true Mongol is specially distinguished from the true Negro by the globular or extremely brachycephalic form of the skull, but this character can by no means be claimed for the whole of the Mesochroic group. The Eskimos, for instance, whose Mongolian affinities are universally admitted, are decidedly dolichocephalic, the average of a large number of skulls giving a cephalic index of 73.35. Many of the American Indians are also dolichocephalic, and many again are brachycephalic, so that between them it is impossible to draw any hard and fast line, and we are forced to admit that this character, at least in the present state of our knowledge, fails to convey any information as to the affinities of the group.

Of the most typical development of the Mesochroic races in

Asia little need be said, as ethnologists are, I think, agreed upon the point. Undoubted Mongols occupy the whole extent of the eastern shores of Asia from Kamchatka to Siam, and thence stretch westward to the Bay of Bengal. Excepting the most eastern parts of Bengal, the Assam Hills, they are, however, nowhere to be met with in the Indian region. But to the north of the Himalayas, that is, to the north of the *Æthochroic* boundary, they occupy the whole of the central plateau which I have assumed to be the original seat of the *Leucochroic* group, and thence they spread over Western Asia, taking the route which has already been attributed to the *Leucochroi*. Thus they reach in historic time as far as Hungary in the west, while their influence is to be plainly traced to the south-west of the Hindu Kush, in the great tableland of Persia. In the east they occupy the southern islands of Japan, whence probably they have expelled the predecessors of the Aino. In this region the true Mongolian character of the various tribes and races of man is undisputed, and I need not therefore enter into any discussion of their affinities. Of the Malays, however, some doubt has been expressed, and they certainly present characters distinguishing them to a considerable extent from the other Mongols. Yet they belong, I think, essentially to the *Mesochroic* group. That they have been greatly modified by crossing is, I believe, the cause of the variation to be detected, for in the first place they have penetrated far to the south, where they were in immediate contact with the *Æthochroic* group, and secondly they have for centuries been influenced by the immigration of Hindus, Arabs, and Chinese, and these two causes must have left their mark deeply impressed, not alone upon their language, manners, and customs, but also upon their physical characters. Their closest affinity is, I believe, with the Mongol, but there are also subordinate affinities, which pertain rather to the domain of ethnology than of anthropology.

The general agreement of the races termed Mongolian in Asia is, I think, so completely acknowledged by ethnologists that I shall not further enter into the question. The only doubt seems to be as to the affinities of the natives of America, yet even this is gradually giving way to the belief in the unity of the Mongolian, Eskimo, and American types. Dr. Pickering¹ has stated, with regard to the two former races, that a personal inspection had satisfied him "that the Esquimaux are Mongolians, and that there is no distinct physical race of man in the Arctic regions," and Mr. Murray² has gathered together not a little evidence in support of the same view. As regards the American affinities

¹ Pickering (C.), "Boston Soc. Nat. Hist. Proc.," vol. ix (1863), p. 182.

² Murray (A.), "Geogr. Distrib. Mammals" (1866), pp. 56 *et seq.*

Mr. Murray says that the "Chinooks and other northern tribes nearest the Esquimaux cannot be distinguished from them; and the tribes next to *them* on the south again pass insensibly into the red-skinned tribes of middle North America. These pass into the digger tribes of California, which have in their turn many of the characteristics of the tribes of Central and South America, and all attempts to elevate the tribes of South American Indians into separate races have long since been abandoned." Indeed the similarity between the tribes of South America is remarkably shown by the statement of the late Mr. Darwin,¹ that some rude Fuegians who sailed on board the "Beagle" were mistaken by the Brazilians for Botacudos, though these tribes are separated by almost the whole extent of South America. Dr. Wilson² has entered very fully into the question of the American cranial type, but though he has demolished the theory entertained by Dr. Morton, the well-known author of the "*Crania Americana*," that one characteristic type of skull could be traced throughout all the races of America, he has unfortunately given us nothing to supply the place of Dr. Morton's generalisations. In a collection of ancient Peruvian skulls markedly dolichocephalic crania were found associated with markedly brachycephalic crania, and though Dr. Morton has endeavoured to account for this divergence of type by attributing the lengthened form of skull to artificial compression, yet the symmetry of the cranium in a vast number of cases renders this hypothesis altogether untenable.

In other characteristics we obtain considerable evidence of similarity of type between the Indians of America and the Mongols of Asia. Dr. Wilson examined specimens of hair obtained from the burial ground of the Hurons near Lake Simcoe, which "retained its black colour and coarse texture, unchanged alike by time and inhumation; and in this respect corresponds with the modern Indians of South America, and also of the Chinese and other true Mongols of Asia." Again, though amongst a group of brachycephalic Peruvian skulls, Dr. Wilson recognised two subdivisions, the one having the bones of the face small and delicate, while the other displayed "the characteristic Mongol maxillary development and prominent cheek-bones," yet the former type is exceptional even in the ancient graves, and seems to be entirely unknown in the modern Indians.

Even in cases which have been regarded by certain anthropologists as decisive, great doubt really exists as to the value of cranial characteristics in the American races, and Dr. Wilson affirms that impartial and competent judges might easily assign

¹ Darwin (C. R.), "*Descent of Man*," 2nd edition (1875), p. 197.

² Wilson (D.), "*Prehistoric Man*" (1862), vol. ii, pp. 199 *et seq.*

the skulls of Iroquois and other northern tribes to the Eskimo type, notwithstanding the alleged characteristic form of the Eskimo skull. He goes further even than this, however, maintaining that the "elements of contrast between the Hurons and Esquimaux are mainly traceable in the bones of the face, physiognomical, but not cerebral," while he expresses his own view upon the question by stating that an "examination of Arctic crania, and a comparison of them with those of the North American Indians in the Morton collection, has by no means tended to confirm" his "faith in the existence of any such uniform and strongly marked line of difference as Dr. Morton was led to assume from the small number of examples which came under his observation." Finally, Dr. Wilson sums up the evidence which he has brought forward on the subject of the American cranial type in the following words:—"It is indeed an important and highly suggestive fact, in the present stage of ethnological research, that authorities the most diverse in their general views and favourite theories as to the unity and multiplicity of human species, can nevertheless be quoted in confirmation of opinions which trace to one ethnic centre the Fin and Esquimaux, the Chinese, the European Turk and Magyar, and the American Indian." With this remark I shall leave the question of the physical resemblances of the Mesochroic group, concerning which there is such concurrence of testimony that any lengthened discussion seems unnecessary.

With reference to language, the evidence is also conclusive of the unity of origin of the Mongolian and American races. Of the Koriak in Eastern Asia Dr. Latham¹ has affirmed that it is "notably American." He regards, indeed, the whole group of languages spoken by the inhabitants of the Arctic region as "dialects of a single language—the Eskimo."² He says the "language of Greenland and Labrador is Eskimo. The language of the eastern extremity of Asia is Eskimo. The language of the Aleutian Islands is Eskimo. The language of the interjacent regions is Eskimo also." And further, he says that in "North America the connection with Asia is decided."³ In summing up the characters of the American languages Dr. Latham⁴ states that in "any South American vocabulary of adequate length, some North American root presents itself—some, indeed, from the extreme north, *e.g.*, the Eskimo area. Now as borrowing is out of the question (while the words are not of the sort to be excogitated by distant speakers), this, along with the phenomena of the transition, is the chief philological argument in favour of the fundamental unity of the two classes.

¹ Latham (R. G.), "Elements Comp. Philol." (1862), p. 176.

² *Ibid.*, p. 385.

³ *Ibid.*, p. 517.

⁴ *Ibid.*, p. 521.

That the transitions are obscure is, from the scantiness of our data for the most important points, what we expect, *à priori*."¹ Dr. Latham, in fact, considers the unity of the languages of North and South America to be so well established that he doubts whether the "ordinal value" of the whole class "is higher than that of the so-called Indo-European in its most restricted form."

The foregoing arguments, brief as they are, appear sufficient to justify our including in one group the races of the Old World known as Mongolian, the races of the New World generally spoken of collectively as American Indians, and the races, including the Eskimos, Lapps, Finns, and others, occupying the Arctic regions. Whatever may be their differences, these are not greater than are to be found in the other great groups; while the transition, both as regards physical structure and language, seems to be more gradual between one race and another than is the case with either the Leucochroi or Æthochroi.

It remains now only to suggest the possibility of yet another development of the Mesochroic group, and this is, I believe, to be found in the Bask. These inhabitants of the western shores of Europe have long been a puzzle to ethnologists, and the suggestions as to their affinities are without number. But I think that when the casual statements of many writers are put together the evidence is in favour of a Mesochroic origin. Carl Vogt² affirms, upon anatomical grounds, that the "Basques are, as yet, an unsolved problem; they cannot possibly have come from Asia." In a note are added some observations of M. Broca, upon the cranial development of the Basks. He claims to have proved that between the dolichocephaly of the Bask and of the Indo-Germanic races there is an essential difference, while between the Bask and the African Negro there are decided points of resemblance in this respect. He points out, however, that though this resemblance exists, other characters, such as the smallness of the upper jaw, by no means correspond in the Basks and Negroes, while, as regards the special form of dolichocephaly exhibited by the former, he states that it "belongs essentially to the American race." Other points of agreement between the Basks and the American races could be cited, tending to prove their physical affinity, did space permit, but I must be content with a single argument derived from language. Professor Whitney³ has remarked that the "Basque forms a suitable stepping-stone from which to enter the peculiar linguistic domain of the New World, since there is no other dialect

¹ Latham (R. G.), "Elements Comp. Philol." (1862), p. 521.

² Vogt (C.), "Lectures on Man," Engl. Transl. (1864), p. 381.

³ Whitney (W. D.), "Life and Growth of Languages" (1875), p. 259.

of the Old World which so much resembles in structure the American languages." Judging from his own standpoint, and consequently passing over in silence the observations of Broca and Carl Vogt, to which I have already referred, he concludes that the "Basques are a white, 'Caucasian' race; there is nothing in their other ethnological characteristics which should forbid our connecting them with any great division of the white race; but their speech at once cuts them off from every other, and we accept its decision as authoritative."

In considering the geographical distribution of the Mesochroic group, I confess I am at a loss for a starting-point. To place the original seat of the group in America would certainly remove many difficulties, with reference to the distribution of the Leucochroic group, but such a course would not, I think, be satisfactory in other respects. Probably the distribution of the extinct rhinoceros defines tolerably nearly the original distribution of the Mesochroic group in the Old World. The boundary of the region on the south stretches from the northern shores of the sea of Okhotsk to the Black Sea, and thence follows the shores of the Mediterranean to the Atlantic; while on the north the boundary was doubtless formed by the then existing sea, wherever that may have been. It is, however, to be observed that no remains of rhinoceros have hitherto been found in Norway, Sweden, Finland, Lapland, or Novaya Zembla, which we may therefore presume to have been then submerged beneath the waters of the Polar Sea. In this region I think the Mesochroic group once had its home, and hence I think it has been to some extent expelled by changes of physical geography, and consequently of climate, and at a comparatively late date by the incursion of martial races from the Leucochroic region of Asia. Thus I think we may account for the anomalous character of the human remains to be met with in many of the most ancient places of sepulture in Europe, and thus we may account for a remnant of a race with markedly American affinities in the extreme west of Europe. There exists one difficulty in the way of readily accepting this theory, however, which must at once occur to every ethnologist, namely, the truly American and not Eskimo affinity of the Basque and American languages. To explain this we are forced to revert to the old Atlantis theory, which has been so often proposed, rejected, and again proposed. Yet there is in fact no great geological difficulty in the way of accepting this proposal. Great as are the depths at some points in the Atlantic between North America and Europe, yet an elevation of 2,500 fathoms would unite the two continents. Moreover, the distribution of certain groups of mammals appears to me to favour the belief in the oft-derided Atlantis. We have seen the

extension of the rhinoceros, as represented by fossil species, in the Old World, and it is interesting to find it also in North America, the more so as its position to the east of the Rocky Mountains seems to point to migration between Europe and America, and not between Asia and America. I shall not attempt to explain the distribution of the existing rhinoceros, but some reference seems necessary to the fossil species found in India. The affinities of these seem to be entirely with the existing species of the Old World, and however they came to occupy their present position, we may, I think, admit that they existed independently of the northern species, from which probably they were severed long anterior to the distribution of mankind.

I have already referred to the distribution of the wolves as indicating what, in my opinion, has been the course of migration of man through Asia and Europe, and it is observable that these extend, with little specific variation, throughout North America, between the Tropic of Cancer and the Arctic circle; whether, however, the migration was between Europe and America or between Asia and America it would be impossible to decide. The wolves and foxes which collectively extend so universally throughout Asia and Europe, north of the *Æthochroic* boundary, also occupy the whole of North America, but there again it is impossible to determine the course of migration.

The fossil representatives of the horse point very clearly, as it seems to me, to a connection between Europe and North America. In the Old World the *Equidæ* extend eastwards, so far as we are at present aware, but little beyond the Caspian, occupying the Atlantic coast from Spain to the Baltic in the west. In North America they occur throughout the United States north of the Tropic of Cancer, and as they are distributed throughout South America they doubtless originally extended through the interjacent region. This seems to point indubitably to a connection between Europe and America, though perhaps to one of very early date. Other instances might be given, pointing in the same direction, though presenting anomalies which unquestionably require explanation.

NOVEMBER 10TH, 1885.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From H. LING ROTH, Esq.—The Naturalist on the River Amazon.
By Henry Walter Bates, F.L.S.
- Letters from Jamaica, the Land of Streams and Woods.
- Cyprus as I saw it in 1879. By Sir Samuel White Baker, M.A.
- The Albert N'yanza Great Basin of the Nile, and Explorations of the Nile Sources. By Sir Samuel W. Baker, M.A.
- Explorations in South-West Africa.—By Thomas Baines, F.R.G.S.
- Narrative of the Voyage of H.M.S. "Samarang" during the years 1843–6; employed surveying the islands of the Eastern Archipelago. By Captain Sir Edward Belcher. 2 Vols.
- The Naturalist in Nicaragua. By Thomas Belt.
- Five Months on the Yang-tsze. By Thomas W. Blakiston.
- Observations on the Popular Antiquities of Great Britain. By John Brand, M.A. Revised by Sir Henry Ellis. 3 Vols.
- A Visit to the Philippine Islands. By Sir John Bowring.
- Travels in Assyria, Media, and Persia. By J. S. Buckingham. 2 Vols.
- The Gardens of the Sun. By F. W. Burbidge.
- On Horseback through Asia Minor. By Capt. Fred Burnaby. 2 Vols.
- A Ride to Khiva. By Fred Burnaby.
- The Great Lone Land. By Major W. F. Butler, C.B.
- Armenians, Koords, and Turks. By James Creagh. 2 Vol.
- Life in Asiatic Turkey. By the Rev. E. J. Davis, M.A.
- The Land of the Midnight Sun. By Paul B. Du Chaillu. 2 Vols.
- History of Madagascar. By the Rev. W. Ellis. 2 Vols.
- Australia. By J. Foster Vesey Fitzgerald.
- The History of Civilization. By F. Guizot. 3 Vols.
- Visit to the Great Oasis of the Libyan Desert. By G. A. Hoskins, Esq.
- Personal Narrative of Travels to the Equinoctial Regions of America. By Alexander Von Humbolt. Translated by Thomasina Ross. 3 Vols.
- Physiography. By T. H. Huxley, F.R.S.

- From H. LING ROTH, Esq.—Four Years in Queensland. By E. B. Kennedy.
- On the Road to Khiva. By David Ker.
- Diary of a Pedestrian in Cashmere and Thibet
- An Account of the Manners and Customs of the Modern Egyptians. By Edward W. Lane. 5th Edition. 2 Vols.
- Cochinchine Française et Royaume de Cambodge. Par Charles Lemire. 2nd Edition.
- Discoveries in Egypt, Ethiopia, and the Peninsula of Sinai, in the years 1842-5. By Dr. Richard Lepsius. Edited by K. R. H. Mackenzie.
- La Colonisation Française en Nouvelle-Calédonie et Dépendances. Par Charles Lemire.
- Pérag et les Orangs-Sakèys. Par Brau de Saint-Pol Lias.
- A Popular Account of Missionary Travels and Researches in South Africa. By David Livingstone, M.D. New Edition.
- A Popular Account of Dr. Livingstone's Expedition to the Zambesi and its Tributaries; and of the Discovery of Lakes Shirwa and Nyassa. Abridged from the larger work.
- Russia. By W. R. Morfill.
- Ancient Scottish Lake-Dwellings or Crannogs. By Robert Munro, M.A., M.D.
- Travels in India, including Scinde and the Punjab. By Captain Leopold von Orlich. Translated by H. Evans Lloyd, Esq. 2 Vols.
- Narrative of a Year's Journey through Central and Eastern Arabia (1862-3). By W. Gifford Palgrave. 2nd Edition, 2 Vols., and 7th Edition.
- Note sur les Fuégiens. Par Le Docteur Ad. Nicolas.
- Travels in Kordofan. By Ignatius Pallme.
- Kidnapping in the South Seas. By Captain G. Palmer.
- How I crossed Africa. By Major Serpa Pinto. Translated by Alfred Elwes. 2 Vols.
- The Songs of the Russian People. By W. R. S. Ralston, M.A.
- Danish Greenland: its People and its Products. By Dr. H. Rink. Edited by Dr. R. Brown, F.L.S.
- The Works of William Robertson, D.D. 12 Vols.
- Turkistan. By Eugene Schnyler, Ph.D. 2 Vols.
- Siberia in Europe. By Henry Seebohm, F.L.S., F.Z.S.
- Russia on the Black Sea and Sea of Azof. By H. D. Seymour, M.P.
- Journal of the Discovery of the Source of the Nile. By John Hanning Speke, Captain in H.M. Indian Army.
- The Data of Ethics. By Herbert Spencer.
- The Cruise of H.M.S. "Challenger." By W. J. J. Spry, R.N.
- Russia before and after the War. By the Author of "Society in St. Petersburg," &c. Translated by Edward Fairfax Taylor.
- Nineteen Years in Polynesia. By the Rev. George Turner, LL.D.
- Savage and Civilised Russia. By W. R.

- From H. LING ROTH, Esq.—A Voyage towards the South Pole, performed in the years 1822–4. By James Weddell, F.R.S.E.
- From SIR JOHN LUBBOCK, Bart., F.R.S.—The Prehistoric Stone Monuments of the British Isles.—Cornwall. By William Collings Lukis, M.A., F.S.A.
- O Lu'n Kunbi. Dialecto do interior de Mossamedes (Alto Cunene). Por A. F. Nogueira.
- From DR. E.-T. HAMY.—Mission Scientifique au Mexique et dans l'Amérique Centrale, Recherches Historiques et Archéologiques. Publiées sous la direction de M. E.-T. Hamy. Première Partie: Histoire. Introduction par M. E.-T. Hamy. Mémoires sur la Peinture Didactique et l'Écriture Figurative des Anciens Mexicains. Par M. Aubin.
- From the AUTHOR.—Conférence faite au Muséum National de Rio de Janeiro le 4 Novembre, 1884. Par le Dr. Ladisláu Netto.
- Beiträge zur Anatomie und Physiologie von C. Eckhard in Giessen. Elfter Band.
- China and the Roman Orient: Researches into their ancient and mediæval relations as represented in old Chinese Records. By F. Hirth, Ph.D.
- Die Namen der Nutzmétalle. Von E. Reyer.
- Meteoreisen. Von E. Reyer.
- Cielo. Par F. Maltese.
- Uganda und sein Herrscher Mtesa. By Dr. Robert Felkin.
- Sulla Lunghezza relativa del Primo e Secondo Dito del Piede Umano. By Giulio Barroil.
- Mourning and War Customs of the Kansas. By the Rev. J. Owen Dorsey.
- Quelques Observations sur la Distribution Géographique des Opatas, des Tarahumars, et des Pimas. Par le Dr. E.-T. Hamy.
- Procédé de Mensuration des os longs dans le but de reconstituer la taille. Par M. Topinard.
- Instructions Anthropométriques pour les Voyageurs. Par le Dr. Paul Topinard.
- La Nomenclature quinaire de l'Indice Céphalique. Par P. Topinard.
- The Aryan Maori. By Edward Tregear.
- A Sketch of the Agriculture and Peasantry of Russia. By Henry Ling Roth.
- Silex Tertiaires. Par M. Adrien Arcelin.
- Sur l'Interprétation de la Quantité dans l'Encéphale et dans le Cerveau en particulier. Par le Docteur L. Manouvrier.
- Une Sépulture de Femme à l'époque Gauloise dans la Marne. Par M. le Baron J. de Baye.
- Catalogo da Exposicao Medica Brasileira. By Dr. Carlos Costa.
- From the SECRETARY OF STATE FOR INDIA IN COUNCIL.—Panjâb Customary Law. Vol. V. The Customary Law of the Ludhiâna District. By T. Gordon Walker.

- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Archiv für Anthropologie. Band XVI, 1s. und 2s. Vierteljahrshft.
—Correspondenz-Blatt. 1885, Nos. 6-9.
- From the R. ACCADEMIA DEI LINCEI.—Osservazioni Meteorologiche fatte al R. Osservatorio del Campidoglio. Dal Luglio al Dicembre, 1884.
- From the SOCIETY OF ANTIQUARIES.—Archæologia. Vol. XLVIII.
- From the SOCIETÀ ITALIANA DI ANTROPOLOGIA.—Archivio per l'Antropologia e la Etnologia. Vol. XV, Fas. 1.
- From the BERLINER GESELLSCHAFT FÜR ANTHROPOLOGIE.—Zeitschrift für Ethnologie. 1885, Heft. 2, 3.
- From the SCOTTISH GEOGRAPHICAL SOCIETY. The Scottish Geographical Magazine. Vol. I, Nos. 1-3.
- From the SECRETARY OF THE CONGRÈS INTERNATIONAL D'ANTHROPOLOGIE ET D'ARCHÉOLOGIE PRÉHISTORIQUES. Compte Rendu de la Neuvième Session à Lisbonne, 1880.
- From the ARCHEOLOGICAL SOCIETY, AGRAM.—Viestnik Hrvatskoga Arkeologickoga Druztva. Godina VII, Br. 3.
- From the GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.—Report of Progress, 1882-4. With 6 maps.
—Catalogue of Canadian Plants. Part II: Gamopetalæ. By John Macoun, M.A., F.L.S.
- From the DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY.—Report. Vols. III, VIII.
—Monographs. Vols. IV, VI, VII, VIII.
—Contributions to North American Ethnology. Vol. V.
- From the SMITHSONIAN INSTITUTION.—Smithsonian Contributions to Knowledge. Vols. XXIV, XXV.
—Prehistoric Fishing in Europe and North America. By Charles Rau.
- From the ACADEMIE ROYALE DE BELGIQUE.—Annuaire, 1884, 1885.
—Bulletins. 3me Série, Tom. VI-VIII.
—Mémoires. Tom. XLV.
—Mémoires Couronnés et autres Mémoires. Collection in 8vo. Tom. XXXVI.
—Mémoires Couronnés et Mémoires des Savants Étrangers Tom. XLVI.
- From the SOCIETÀ DI SCIENZE NATURALI ED ECONOMICHE DI PALERMO.—Giornale di Scienze Naturali ed Economiche. Vol. XVI.
- From the ACADEMY.—Proceedings of the Academy of Natural Sciences of Philadelphia, 1871-1882.
—Atti della Reale Accademia dei Lincei. Serie Terza. Memorie della Classe di Scienze Fisiche, Matematiche e Naturali. Vols. XIV-XVII. Serie Quarta. Rendiconti. Vol. I, Fas. 13-23.
—Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg. Tom. XXX, No. 2.
—Kongl. Vitterhets Historie och Antiquitets Akademiens Manadsblad. 1884.

- From the ASSOCIATION.—Journal of the Royal Historical and Archæological Association of Ireland. Fourth Series. Nos. 61, 62.
- Report and Transactions of the Devonshire Association. Vol. XVII.
- Transactions of the Devonshire Association. Extra Volume. The Devonshire Domesday. Part II.
- Proceedings of the Geologists' Association. Vol. IX, Nos. 2, 3.
- From the INSTITUTE.—Proceedings of the Royal Colonial Institute. Vol. XVI.
- Proceedings of the Canadian Institute. Vol. III, No. 2.
- Transactions and Proceedings of the New Zealand Institute, 1884. Vol. XVII.
- From the INSTITUTION.—Journal of the Royal United Service Institution. No. 10.
- From the SOCIETY.—Proceedings of the Royal Society. Nos. 237, 238.
- Proceedings of the Society of Antiquaries. Index to Vol. IX.
- Proceedings of the Royal Geographical Society, 1885. July to November.
- Journal of the Society of Arts. Nos. 1701-1719.
- Proceedings of the Asiatic Society of Bengal, 1885. Nos. 1-5.
- Journal of the Asiatic Society of Bengal. Vol. LIII, Part II, No. 3; Vol. LIV, Part I, Nos. 1, 2.
- Centenary Review of the Asiatic Society of Bengal. From 1784 to 1883.
- Transactions of the Asiatic Society of Japan. Vol. XII, Part 4; Vol. XIII, Part 1.
- Journal of the China Branch of the Royal Asiatic Society. New Series. Vol. XVIII; Vol. XIX, Part 1; Vol. XX, Nos. 1, 2.
- Proceedings of the Philosophical Society of Glasgow, 1884-5.
- The Sixty-fifth Report of the Council of the Leeds Philosophical and Literary Society.
- Proceedings of the Literary and Philosophical Society of Liverpool. Vol. XXXVIII.
- The Proceedings of the Royal Society of Queensland. Vol. I, Parts 2-4.
- Proceedings of the American Philosophical Society. Nos. 117-119.
- The Organization and the Constitution of the Women's Anthropological Society.
- Bulletins de la Société d'Anthropologie de Paris. 1885, Fas. 2, 3.
- Bulletin de la Société d'Anthropologie de Bruxelles. Tome III.
- Bulletin de la Société Impériale des Naturalistes de Moscou. 1884, No. 3.

- From the SOCIETY.—Bulletin de la Société de Borda, Dax. 1885, Nos. 2, 3.
 — Schriften der Physikalisch-ökonomischen Gesellschaft zu Königsberg i. Pr. 1884, 1e. u 2e. Abth.
 — Boletim da Sociedade de Geographia de Lisboa. 4a Serie, No. 12; 5a Serie, Nos. 1-4.
 From the EDITOR.—“Nature.” Nos. 817-836.
 — Journal of Mental Science. Nos. 98, 99.
 — Timehri. Vol. III, Part 2.
 — “Science.” Nos. 123-130, 132-142.
 — The American Antiquarian. 1885, July, September.
 — Revue d'Anthropologie. 1885, Nos. 3, 4.
 — Revue d'Ethnographie. Tom. IV, Nos. 2, 3.
 — L'Homme. 1885, Nos. 12-18.
 — Matériaux pour l'Histoire de l'Homme. 1885, Juillet, Octobre.
 — Bullettino di Paletnologia Italiana. 1885, Nos. 3-8.
 — Revista Internacional de Ciencias Médicas y Biologicas. No. 1.

The election of H.H. PRINCE ROLAND BONAPARTE as an Honorary Member, and of Dr. A. ASHER, Dr. ALEXANDER BAIN, C. F. CLARKE, Esq., J. W. CROMBIE, Esq., M.A., T. H. EDWARDS, Esq., P. NORMAN, Esq., and EDWARD TREGEAR, Esq., as Ordinary Members, was announced.

The PRESIDENT, in opening the meeting, spoke as follows:—

OPENING REMARKS *by the President.*

THERE is little doubt and little cause for surprise that the appreciation of Anthropology is on the increase. Besides the gratifying facts that more new members are joining the Institute, and that the corresponding section of the British Association has become increasingly popular, there are other examples of a no less solid kind. For example, the authorities of Trinity College, Cambridge, have lately extended the tenure of one of their Fellowships for five years, to enable its holder, Mr. J. Frazer, to pursue his anthropological studies; and again, at the meeting of the British Association at Aberdeen it was the Rector of the University, Dr. Bain, who contributed one of the most thoughtful of the Anthropological Memoirs.¹ A notable instance of zeal for the science is now before the Council. It is a proposal by Mr. Featherman to bequeath to the Institute a sum now yielding £100 a year for the following object. Mr. Featherman has been continuously engaged for fifteen years in

¹ See page 380.

compiling the MS. of a large work, the "Social History of the Races of Mankind," of which only two volumes are actually published, and which, like the "Descriptive Sociology" of Mr. Herbert Spencer, contains a multitude of data concerning customs and institutions, methodically arranged. Such works are precious to investigators, but costly to print, as they cannot be expected to sell widely enough to pay expenses. Mr. Featherman devotes the annual sum above-mentioned to print a volume from time to time, and now desires to place the eventual publication of the whole series beyond the reach of the accident of his life. He proposes to make the bequest for the purpose of continuing the printing, leaving at the same time the copyright and stock of the work to the Institute, and providing for the subsequent application of the income to anthropological purposes, leaving considerable discretion to the Council as to how it should be applied.

The social history of alien peoples is full of problems. Thus it is a frequent observation that men may thrive and be happy under the most cruel governments, but the explanation of the several cases is imperfect. We have yet to learn how far it depends on hidden compensations, and how far on the genius of the people. The question of innate varieties in mind and instinct between different races requires more exact investigation than it has yet received. Anyhow, we have to get rid of the common illusion that the axioms of moral conduct, which are or appear to be natural to ourselves, must be those of every other sane and reasonable human being. The very existence of the Anthropological Institute should be construed into a standing protest against such narrowness of view. The world of human mind and instinct is richly variegated, persons even of the same sex and race differing sometimes more widely than ordinary men differ from ordinary women, though of course in other ways, and this amount of difference is indeed large. Foreigners say that we are stiff, and that our naturally narrow powers of sympathy are still further contracted by insular prejudices. Be this as it may, it is certain that the English do not excel in winning the hearts of other nations. They have to broaden their sympathies by the study of mankind as they are, and without prejudice. This is precisely what the Anthropologists of all nations aim at doing, and in consequence they continually succeed in discovering previously unsuspected connections between the present and past forms of society, between the mind of the child and of the man, and between the customs, creeds, and institutions of barbarians and of civilised peoples. Anthropology teaches us to sympathise with other races, and to regard them as kinsmen rather than aliens. In this aspect it

may be looked upon as a pursuit of no small political value. Many are now endeavouring to test mental differences with numerical precision. The possibility and importance of their investigations was strongly insisted upon by Dr. Bain in the Memoir referred to above, while another paper by Mr. Jacobs, which arrived too late to be read at the British Association, and will be published through another channel, contains noteworthy proposals on a method of conducting them. Both of the memoirs submitted to the meeting to-night belong to this branch of Anthropology. That by Mrs. Bryant gives the result of a first scientific attempt to test certain elementary characteristics in the disposition of school-children, and that by Mr. Jacobs endeavours to assign a numerical ratio to the intellectual ability of the Jews as compared to that of other races.

The following paper was then read by the writer:—

EXPERIMENTS *in* TESTING *the* CHARACTER *of* SCHOOL CHILDREN.
By Mrs. SOPHIE BRYANT, D.Sc. Lond.

EARLY in this year, at the suggestion of Mr. Francis Galton, I made some attempts to devise means for testing the mental characteristics of children. Long experience in teaching had made me aware of the fact that the manner in which a paper of written questions is answered sometimes reveals to an attentive observer quite as much about the character of the writer as about the extent and soundness of his or her knowledge. I was in the habit of making mental notes for practical purposes concerning my pupils' defects and excellences as so revealed; and I knew, as a matter of experience, the naturally-to-be-expected fact that a writer tells more tales about his own fundamental intellectual characteristics than a talker in close contact with another mind or other minds is likely to tell; at any rate, he tells different tales.

So I made my first attempt in the following manner. A number of children, all aged thirteen, were allowed to remain for about ten minutes in a room which they did not know, and were then required to write a description of it. I did not know the children personally at all, and I had no preconceived idea as to the character-points which I expected to be revealed. I read the papers, noting on them what I found in them; and when I went to the teachers who knew the children afterwards and gave the descriptions of character which I inferred, the agreement with

their general impressions was in all the marked cases somewhat striking.

The room described was, in this case, a schoolroom, having certain features in common with other schoolrooms familiar to the children, but having certain features peculiar to itself, and a sufficient amount of ornament in pictures and otherwise to redeem it from being quite prosaic. The manner, therefore, in which the description of it was given by the children is, I think, a fair test of their general character as observers so far as it goes. It must indeed be understood that the results of a *single* test may be accidental, and I think it ought also to be understood that much less importance should be attached to negative than to positive results.

The points which I noticed in this first set of observations were as follows:—

1. In the perception of an object a logical distinction is made between the sense-impression and the apprehension of it by the mind, as between the passive and active factors of perception. By the act of apprehension the impression is transformed into a perception, constituted such by consciousness of its position as a distinct part of the whole mental content. Apprehension is essentially the bringing of the new into relation with the old, and thus interpreting the new by means of the old.

Now I found in my young observers signs of great variety in the ratio of these two factors of perception to one another. So much was this the case that I found myself able, according to my own diagnosis, whatever that may be worth, to mark for the two factors separately. Impressions were sometimes numerous and faithful where the power of giving them a meaning, and thus perceiving them fully, was clearly very slight, or at least inoperative.¹ In such cases the perception was what would be ordinarily called unintelligent. Care must of course be taken, in deciding on these signs of feeble apprehension, to consider whether the ideas by which a meaning could be given to the impressions in question were ideas that could be fairly supposed present in the child's mind; there can, however, be little room for mistake where bare perceptions with the minimum of apprehension are numerous.

In other cases the impressions either made or at any rate dwelt upon were fewer, but the apprehension very complete. This completeness of apprehension occasionally passed the point of complete perception in most of the perceptions made, and distinct tendencies to pass from perception to pure inference shown. Sometimes the inference was correct, and that not by chance, since it had the marks of having been cautiously con-

¹ See paper I, Appendix.

ducted. Such little phrases as "I suppose," or "it is likely," are tell-tales here, as marking off the cautious from the reckless thinker. This latter person is betrayed also among my cases by a very unmistakable hastiness of inference, which in the bad cases degenerates into actual false perception. For instance, the name, C. W., in the corner of a picture is reported as M. W., this being the name of a girl in school, whom the young observer very well knew.

I found, as indeed might naturally be expected, that the false perceivers were nearly always ready apprehenders, who, as I suppose, digressing into actual inference, inferred carelessly, and projected their false inferences into false perceptions.¹ The carelessness of such inference is of a very simple character; the impressions to the test of which the inference should be brought are there, and it is not brought to the test. This argues absence of the impulse to criticise, which is the basis of accurate habits of thought. Feebleness of the impressions is, it must be admitted, a negative cause for the false perceptions, since the test is thus kept in the background; but it is only a negative cause, since if the critical impulse were really strong, the inference would be challenged at least, even if it could not be corrected. In judgments, however, as to character tests, it would be necessary to estimate this negative cause as otherwise indicated, and allow for it before deciding on the degree of the critical defect.

2. In the second place, differences were observed in the degree of orderliness with which perceptions are marshalled, and in the general notion of order which characterises any particular observer.

Out of twenty observers eight gave evidence of no noticeable interest in order at all; the objects appeared to have been observed haphazard, as far as their relation to one another logically, or in place, went. On the other hand, seven descriptions were as orderly as they could well be expected to be, while to three I gave half marks, and to one two-fifths. In most of the orderly descriptions the order chosen was that of place: the order of the inventory round the room, some starting from the door, some from the opposite point, and some from the clock in the middle. In one or two the order was logical, *i.e.*, the order of what may be called the idea of the room, as in one paper which begins, "The first thing that strikes you are the rows of desks and girls." In another set of papers describing a more ornamental kind of room I found signs of a third kind of order, sometimes very strong—the order, namely, of æsthetic effects, the order in

¹ See paper II, Appendix.

space, and in idea too, being subordinated to the order in feeling for the beautiful.¹

3. Great differences in colour interest were also observable, since some took pains to describe colours fully, while others took no notice of colour at all, or very little. In the same way, any marked interest in form was also shown; though in the experiments under consideration no call was made upon the form-interest so strong as to test defect by the absence of response.

4. One other characteristic, and a most important one, came out into strong relief in a few cases. This is the tendency to substitute feeling for thinking, to apprehend impressions as the minimum of idea with the maximum of emotion, which I will call for simplicity over-emotionalism. An over-emotional person perceives objects habitually as sources of feeling, and that is of course equivalent to not properly perceiving them at all. Now, when in the description of a room a child tells you that it is very beautiful, and there are lovely curtains, and the sweetest flowers, and pretty ornaments, I consider that an evident mark of over-emotionalism, and should, in the educational interest, recommend a wholesome diet of ideas accordingly.

The negative defect—for after all it is a defect—of under-emotionalism, is, like all negative defects, difficult to test; but the freedom from defect reveals itself every now and then in little touches that are very subtle.

The description of another room prettily furnished as an ordinary sitting-room brought out more markedly some of these latter points; but the only new point noticed was an occasional tendency to flights of interpretative imagination, which is after all but a development of the tendency to complete apprehension by combining old ideas for the explanation of the new. An abstract of the results obtained in both these observations is given on the accompanying table, p. 347. The exact numerical marks under each head cannot indeed be considered as at all reliable in the sense of assigning precise degrees of value, and on the whole I am inclined to think that verbal remarks would be more valuable.

In the next observation made, a picture was used as test. The same contrasts as before were to some extent brought out in the various descriptions of the picture; but there was occasion for another set of contrasts in this case, and these contrasts came out decidedly. To see a picture in the full sense is to understand its meaning, and in the interpretation of meaning there is abundant scope for the most varied play of imagination, whether checked by faithful observation or not. Just as the

¹ See paper III, Appendix.

perception of an object resolves itself into the two factors of impression and apprehension, so the observation of a complex of objects resolves itself into the two factors of perception and explanation by means of appropriate fetches of the constructive imagination. Now, in some children we found abundant and accurate perceptive detail, with something like the minimum of constructive explanation. In others the opposite extreme was manifest, explanation good, and details little dwelt upon or even described with imperfect accuracy. Between these extremes the two factors were combined in various ratios, including the ratio of equality characteristic of the well-balanced type of mind.

Again, we observed varieties in the nature of the imaginative play which suggested well-marked contrasts of general character. Sometimes the play of imagination was almost purely intellectual, strictly subordinated to the purpose of fetching ideas for the explanation of observations. This I call the logical or intellectual imagination. In other cases the fetch of imagination was not so much after ideas to construe with as after feelings to luxuriate in; the ideas are overpowered in a mass of vague associated emotion. This, if it can be called imagination at all, may be marked out as the emotional variety, and a touch of it is not, of course, out of place in describing an object like a picture which has distinct æsthetic bearings. But most striking of all were the examples of dramatic imagination, which were not rare; here the picture is lost in the story which it is interpreted as meant to tell; the picture becomes the occasion for a departure into story-land, instead of remaining, as in the first case, the main fact, solely for the explanation of which such departures are at all allowed, and by which they are limited.¹

Besides these marked cases there were doubtful cases, and balanced cases, and cases negative altogether. Sometimes, too, the play of imagination was markedly careless and uncontrolled by the inward critic, as compared with the good cases in which it showed itself sober and self-controlled.²

All the observations above described were conducted several months ago. Quite lately I have tried the picture test again, and with similar results.

It goes without saying that the sources of error in such observations as these are very numerous. Accidental variations in the subject of the observation from time to time may produce quite misleading responses to the tests used. This is the least serious difficulty, however, since it can be dealt with, like all other similar difficulties, by taking the mean of several observa-

¹ See papers IV and V, Appendix.

² See paper VI, Appendix.

tions, and noting at the same time the limits of variation as itself an important fact. More serious are the difficulties arising from the complex implication of mental quantities with one another, which makes it impossible to measure them separately as physical quantities are measured, or calculate them with any pretence to scientific accuracy. The observer may feel pretty sure that there is more of factor A and less of factor B in one complex mental fact of which he has evidence than in another, but his estimate must be, at the best, not only a very rough but a very fallible one. The facts observed are all complex facts, the evidence indirect evidence, and the observer, moreover, reads this evidence through the atmosphere of his own individuality. For the last-named reason it is clear that several observers are necessary, to ensure the maximum of practical trustworthiness in the results. The observers must, however, be agreed on their method of diagnosis; and here again difficulties suggest themselves, since the personal equation in this case affects the method of diagnosis as well as the diagnosis itself, though probably this difficulty might be overcome by full discussion with facts at hand.

All these difficulties notwithstanding, I am satisfied that results obtained by such tests as those described have a genuine practical value, if the observer be careful and not dogmatic, and above all avoid attaching an absolute value to them. Their practical value depends on the use that can be made of them in the education of the person observed, or in the selection of a suitable occupation for him. If a series of observations of this kind could throw any light on mental defects which can be remedied by education, or mental excellencies which can be specially utilised, this would be something gained.

I have made some attempts to apply definite tests to mental operations of a higher kind than those of observation; but though I find it quite possible sometimes to form distinct impressions as to excellence and defect in fundamental intellectual characteristics after a certain amount of intellectual traffic with the individual in ordinary school-work, the application of special single tests is apt to produce no appreciable result at all. With some—many, perhaps—one's knowledge of the true condition of mind is from first to last, after all pains taken, very slight, and at present I see no royal road to investigation of character in its more complex manifestations.

APPENDIX.

I.

Description of a Room.

There is a clock on the wall, given by the old pupils; it has some grass crossed on the top of it. On the same wall there are several pictures, two of Julius Cæsar, there is one of Nero, Augustine, and Titus, and *one of a man standing on the ground with another little figure holding on to his leg.* There is a large one about a place with walls broken and pieces of stone lying about; on the other wall there is a picture of some daffodils in a vase. On the mantelpiece there are some vases; below the mantelpiece there are *some squares of china, all joined together with a pattern on it, done in red.* There is some green cloth on the window-sill and *some rock on one of the window-sills*, and a plant on another. There is a green notice board by the door, and over that there is *a picture with likenesses in it of men and women dressed in foreign costumes.* The gas is hanging in the middle of the room. There are three windows and three ventilators on the opposite wall.

II.

Description of a Room.

Entering the above room, if you examined the right-hand side you would see the blackboard, and in the centre of it overhead you would see a picture of a vase of daffodils, painted by Miss C. M. W.; the daffodil is our school flower. Turning round you would see all along the wall pictures of different people who lived long ago—for instance, Augustus, Julius Cæsar, Titus, and a great many more. In the centre there is a large picture of Rome, and above it the clock presented by Mr. C. T. P. There are pictures of men who lived long ago on each side of it. Now on your left-hand side there are three windows, each of which have coverlets (green) on the sills; on the first there is a very large piece of white coral. On the centre window-sill there are two ginger pots, containing dried grasses. On the right-hand window there is a pot of riband ferns; all three windows have their sills covered in green. In the front there is a cupboard, and then comes the slate, then Mrs. B.'s table, which is raised on a platform. Next come the mantelpiece and stove. There are very pretty pink and white tiles between the mantle-board and the stove. The mantle-board has a green covering, and at each end there is a red pot of grasses, and in the centre an Oriental pot. Over this there is a

picture and a portrait of one of the Governors. After this comes the list; and, lastly, the notice board; over this there are some coloured pictures in a gilt frame, bound round with red plush; it is presented by Miss S. Mrs. B.'s room is very pretty, but I cannot remember anything more about it.

III.

Description of a Room.

We went to see Miss B.'s room to-day, which is on the ground floor. The first thing I noticed when I went in was a cabinet full of old china. On looking round I saw that the walls were hung with pictures. On one side of the fireplace was a bracket, holding some more china. The mantle-board was high, and above it was suspended a looking-glass, framed in black and gold. Ornaments were also placed on the mantle-board. A fire was burning brightly in the tiled hearth, and the sun was shining through the half-drawn Venetian blinds. A little table containing books was standing near one of the windows.

IV.

Description of a Picture.

This picture represents four dogs, two of which are brothers. It is at night, and they are awakened by the sound of a mouse. They all jump up, frightened, and just as the white puppy is about to get out of his kennel, he sees the mouse, springs upon it with his two front paws, while the other little dogs are waiting patiently to see the result. The white puppy shows the younger ones how, when they get older, to catch mice. The kennel is made of wood, with iron bars round it. It is very large, because all the puppies have to live in it. At the side of the kennel is a large broom.

It is called the "First Lesson."

V.

Description of a Picture.

A mother bird had been looking for apartments suitable for hatching her young, as her abode where she lived at the present time did not suit. She at last arrived at a place where, on the wall, were these words, "Apartments to let," written on a piece of paper, and, thinking this was the very thing, she deposited her articles of "furniture" on the ground, and collected the straw

together, and there left them to go and look for necessities. One bird after a little time came out of its shell and looked around till its eyes rested on the printing, which he could not at all make out, and seeing that he was alone, but for his unconscious brothers or sisters, he had nothing else to do but to remain where he was (as he could not fly) till his mother returned, which she did in a few minutes, much to the young one's surprise, for he did not know he had one.

VI.

Description of a Picture.

The picture shows a lot of egg-shells, out of which the little fluffy chickens are just beginning to come. It is in the night. They are in open air, and there is not much straw for them to lie on. The bits of shell are lying on the ground, and it is very cold for them, being so small. There is an empty house next to them with "Apartments to let" written on a board; and one of the little things is looking up at the house as if asking to be taken in and kept safe and warm till he grows larger and can take care of himself.

DESCRIPTION OF A ROOM.

Testing the Character of School Children.

347

FIRST SET OF OBSERVATIONS.				SECOND SET OF OBSERVATIONS.				REMARKS.	
Impression.	Correct Apprehension.	Incorrect Apprehension.	Order.	Impression.	Correct Apprehension.	Order.	General.	Special.	
A .8	1	..	1	A 1	.6	1	Observation very good ..	Colour not particularly noticed.	
B .8	1	..	1	B 1	1	.2	Observation and intelligence very good.	Artistic feeling for colour.	
C 1	.6	..	1	C .7	.7	.7	Good paper.		
D .6	1	..	1	D .7	.6	.6			
E .5	1	..	1	E 1	.7	.5	Observation good.		
F .6	.8	..	1	F .7	.7	.2	Observation and intelligence good.		
G .8	.8	..	1	G 1	.7	1	Emotional paper.		
H 1	1	..	1	H .5	.5	.5	Intelligence and observation good.		
I 1	..	..	..	I .7	.7	.6	Observation good ..	Colour much noticed, but not always correctly.	
J 1	1	..	.5	J .5	.6	.2	Emotion chiefly of a weak order, observation and intelligence fair.		
K 1	1	..	.5	K .5	.5	..			
L 1	.2	-1	.5	L .5	.5	..			
M .5	1	..	.2	M .6	.5	.7			
N 1	.1	..	..	N .8	.5				
O 1	1	..	..	O .6	.2				
P .5	.2	..	..	P .5	.6	..			
Q 1	..	..	..	Q .5	.6	..			
R .5	.5	..	..	R .5	.5	.7			
S .5	.5	..	..	S .3	.3	..	Inaccurate.	Colour not noticed at all. Colour much noticed. Colour not noticed at all, but rather form and size.	

DESCRIPTION OF A PICTURE.

	Impression.		Correct Apprehension.		Incorrect Apprehension.		Emotional Tendencies.	Imagination.	Number.	Colour.
	Marks.	Remarks.	Marks.	Remarks.	Marks.	Remarks.				
A	5·5	.. ..	1	Very clever ..	.. ..	.. ..	.. ..	Very dramatic, over-balances observation altogether.	..	..
B	1	Very good and detailed.	1	Very intelligent, though without sense of humour.	.. ..	.. ..	Touch of emotion	Imagination, intellectual and dramatic; very well balanced.	Not noticed..	Not noticed.
C	8	Good ..	6	Active, but not intelligent.	.. ..	.. ..	.. ..	Fair and balanced..	Vague ..	Fair.
D	8	Good ..	5	Fair ..	.. ..	.. ..	.. ..	Play defective ..	Good ..	Fair.
E	5	.. ..	4	.. ..	.. ..	.. ..	.. ..	Slight ..	Vague ..	None.
F	1	Very good	5	Only fair	.. ..	.. ..	.. ..	No play ..	Good ..	Fair.
G	5	Fairly full, but careless.	1	Very intelligent	.. ..	.. ..	.. ..	Defective ..	Defective ..	Defective.
H	5	.. ..	4	.. ..	.. ..	.. ..	Slightly emotional	No play ..	None ..	None.
I	8	.. ..	5	.. ..	.. ..	.. ..	Feeling fair ..	No play ..	Good ..	None.
J	8	.. ..	4	.. ..	.. ..	.. ..	Feeling fair ..	Defective ..	Good ..	Good.
K	3	Poor ..	6	Active	-3	Inaccurate, careless	.. ..	Defective ..	Vague ..	None.
L	4	.. ..	5	Fairly active, but careless.	-2	Inaccurate	.. ..	Defective ..	Fair ..	None.
M	1	Good ..	5	.. ..	.. ..	.. ..	Emotional play..	.. ..	Good ..	Fair.
N	5	Good in detail	5	.. ..	.. ..	.. ..	.. ..	No play ..	None.	..
O	5	Good in detail	7	.. ..	.. ..	.. ..	.. ..	Imagination intellectual.	..	..

DESCRIPTION OF A PICTURE—continued.

	Impression.		Correct Apprehension.		Incorrect Apprehension.		Emotional Tendencies.	Imagination.	Number.	Colour.
	Marks.	Remarks.	Marks.	Remarks.	Marks.	Remarks.				
P	.5	..	.5	..	..	..	..	Imagination intellectual.		
Q	.4	..	.4	..	..	..	..	No play ..	Inaccurate ..	None.
R	.4	..	.5	..	..	..	Paper decidedly shows tendency to dissolve into emotion. Want of control in fancy.	Emotional and dramatic. Imagination not controlled	Vague ..	None.
S	.8	Detailed	1	..	..	..	Play of emotion..	Intellectual, just enough for full perception.	None	Fair only.
T	.8	..	.5	Mechanical	..	..	Want of intellectual play on whole.	.. ..	..	Good.
U	.4	..	1	..	..	..	..	Intellectual and dramatic play.	..	None.
V	.2	..	.5	..	-5	False	..	Play rather meaningless.	Vague	Fair.
W	1	Observation very complete, balanced in detail, and intelligent.	1	..	..	..	..	Intellectual.	..	
X	.4	..	.8	..	..	..	..	Intellectual and slightly dramatic.	Inaccurate..	None.
Y	.5	..	.5	..	..	..	..	Intelligent play ..	Inaccurate..	Fair.
Z	.6	..	1	..	..	..	..	Emotional mainly..	None	None.
A1	.8	..	.4	..	..	..	..	Play defective ..	Inaccurate..	Fair.

DISCUSSION.

The PRESIDENT said that in new investigations of this kind it was the first step that was the most difficult to make. It was very satisfactory that this first step had been made by a person so singularly well qualified as Mrs. Bryant, who, as was well known, had gained one of those rarely earned and highly prized degrees of Doctor of Science at the London University, on the ground of her proficiency in mental science. Mrs. Bryant also had large experience in practical education. We could therefore be sure that a person who had the precise gifts needed to carrying on these investigations successfully would make sure advance. He was an optimist in respect to this inquiry, seeing that much had been really accomplished, and that we could hardly stand still, but must advance, and he did not see any boundary that certainly would limit that advance.

Mr. SULLY thought Mrs. Bryant's paper extremely suggestive. He had little to offer in the way of criticism, but would confine himself to throwing out one or two ideas that had occurred to him in listening to the paper. He was particularly struck with the way in which Mrs. Bryant had been able to distinguish between the two factors in observation, seeing what is directly present to the eye and interpreting what is seen. He thought her experiment might appropriately be followed by others specially designed to test each of these factors separately. Thus, the strictly visual capacity might be investigated by presenting objects having the minimum of suggestiveness, that is to say, perfectly definite but unerring forms, such as could be constructed by an arbitrary arrangement of lines. This would test the power of seeing finely, accurately, and rapidly. The other, or interpretative factor, would perhaps be best estimated by sketchy drawings of the human figure, landscape, and so forth, where just enough of concrete form is present to excite the imagination, and at the same time to offer unlimited scope for a varied constructive activity. Such an experiment would serve to bring to light the difference in children's power of taking sense hints, as they might be called, or of creating whole objects, or scenes, out of the scantiest data of sense impressions.

Mr. F. STORR welcomed Mrs. Bryant's paper as a sign that practical teachers were not only aware that psychology was an essential part of their training, but also beginning to co-operate with psychologists, and furnish them with observations on which to build. He criticised Mrs. Bryant's experiment as too ambitious, attempting, as it did, to test at once the powers of observation, retentiveness, and imagination. He referred to certain tests proposed by Mr. C. H. Lake, the first Secretary of the Education Society, by which it was attempted to determine quantitatively at any given time a child's *faculties*, as distinguished from knowledge and method, which are gauged by ordinary examinations. He called on Mr. Sully and other psychologists present to set school-

masters definite work of this kind, and promised, as a schoolmaster, to do the best to carry out their instructions.

Mr. CARVETH READ expressed his appreciation of Mrs. Bryant's paper, both for its general conception and the method of marking it out. He would only suggest that the scheme of such experiments might be extended by keeping a record of the mental characteristics of children at different ages, and especially of the same children year by year. We might then learn at what ages, on the average, different faculties of observation, imagination, reasoning, became conspicuous, and in what degrees and proportions, and so regulate education as to begin the training of these faculties severally at the most favourable times. It would also be interesting to know whether the same general mental character persisted from year to year, or changed; in what proportion of cases early mental promise was fulfilled; at what ages changes of mental balance were to be looked for. If the studies preferred by children excelling in certain faculties were recorded, we might perhaps infer that such studies were fitted to train those faculties.

The following paper was then read by the author:—

*THE COMPARATIVE DISTRIBUTION OF JEWISH ABILITY.*¹

By JOSEPH JACOBS, Esq., B.A.

[WITH PLATE XV.]

In a previous communication to this Institute² I laid before it all the information I could collect as to the racial characteristics of modern Jews, their vital statistics, and bodily measurements. At the same time I expressed my belief that it would be possible to estimate with some degree of precision their intellectual ability as compared with that of other Europeans, and I promised to give this comparison on some future occasion. I shall endeavour to redeem that promise in the following pages. In doing so I find myself in face of two difficulties. The first was to discover a method of measuring ability. The heights of Jews can be calculated easily enough, their vital statistics need only to be collected from the bureaux of Europe. But who shall measure a man's mind so as to compare it with that of others? It was necessary to find some method that would give definite

¹ Parts of this paper were read before the Aberdeen Meeting of the British Association.

² "Journ. Anthropol. Inst.," August, 1885.

results and should have at the same time some claims to scientific accuracy and trustworthiness. Fortunately for me such a method has been before the world for the last sixteen years in Mr. Galton's "*Hereditary Genius*," and what I shall do in this investigation is only to apply to Jews the same line of argument that he applied to Englishmen in that well-known book. But having found my method, there still remains the second difficulty of explaining it in such a way that it will not be too wearisomely arithmetical. Roughly speaking, the method consists in finding how many eminent men of certain rank exist in each million of Englishmen and of Jews. To do this it is impossible to avoid numerical details, and I fear I must force the reader to pass some time in the uncongenial company of the Rule of Three. Luckily, however, the method likewise admits of being exhibited in a graphic form, and I hope to render it intelligible by means of a couple of diagrams, and by drawing upon the reader's imagination to make two tolerably simple suppositions.

The first is this. Suppose we ordered a tailor to cut out a piece of cloth under the conditions that it should be—(1) of fixed breadth; (2) contain a fixed area; (3) be symmetrical about a central axis; and (4) have no indentations in it. He would soon find that the first snip of the scissors would determine the shape of the cloth. For if (as in the dotted lines of fig. 1, Plate XV) he began to cut within the pattern curve he would have to bring the outline outside it, in order to make up the given area, and if he began outside it he would have to bring the apex within for the same reason. Bearing this sartorial experience in mind we may turn to our second stretch of imagination. I have said that our method consists in estimating the number of eminent men among a million Englishmen or Jews, as the case may be. Suppose that we had these million men collected together on Salisbury Plain, and suppose further that we were gifted with the insight of a recording angel and could arrange them in sixteen classes according to their ability, ranging from the greatest genius among them to the most degraded idiot. A long wall with fifteen projecting walls perpendicular to it would give us, as it were, sixteen pens, in which we could place our various classes. It is obvious that the central or mediocre classes would contain far more than the extremes: geniuses and, luckily too, idiots are far more rare than mediocrities. As a matter of fact, on the hypothesis here employed of the distribution of ability according to the law of deviation from the average, the two central classes would stretch out a broad mass of humanity nearly twice as long as the base line. If now we built a wall round our million men thus classified this would describe a curve

resembling in shape a section of a penny trumpet.¹ But this curve is of the same kind as we previously requested our tailor to cut out for us; it is of fixed breadth, symmetrical round the central axis, of fixed area, that filled by a million men, and it has no indentations, for there cannot be a larger number of men in a class more remote from mediocrity than in one nearer. But if this is so, we know from our former supposition that after a small portion of the boundary wall at the extremity had been built the shape of the remainder would be determined, so that all that would be necessary would be to find the number of men forming the first three or four classes and build the wall enclosing them. Mr. Galton built that wall for Englishmen, if I may say so, in his book "*Hereditary Genius*," and I have endeavoured to do the same for Jews and incidentally for Scotchmen, with results roughly indicated in fig. 2. This has been drawn out of scale at the extremities for the sake of clearness, and only gives approximately the true shape of the curve of distribution of ability on Mr. Galton's hypothesis, that talent is distributed round an average mediocrity like shots are distributed round the bull's-eye of a target ("*Hereditary Genius*," pp. 30-34).² With this explanation I turn to the calculations, which enable us, however roughly, to estimate the comparative distribution of ability among Englishmen, Scotchmen, and Jews.

But first we must recall the estimate by which Mr. Galton was enabled to determine the distribution of English ability. As will be remembered, he estimated that of every million Englishmen over fifty, 425 obtained sufficient reputation to earn them a place in Cooper's "*Men of the Time*," and of these 425 there would be 250 of equal or superior ability to that of an English judge. Assuming then that the exponential law of error applied to the distribution of talent he was enabled to subdivide these 250 into three classes, equally removed from one another. The first class (termed Class X) was composed of only one individual, whose prominence may be conceived from the fact that only 9 of this class are living at one time in the United Kingdom, only 2 among Englishmen over fifty. The next class, G, would include 14 members in each million, or 111 of all ages in the British Isles, while the third class, F, would average 233 per million; so that these islands would have 1,863 individuals of this class, but only 468 over fifty, before which age, as a rule, men do not obtain fame. These results, while enabling us to render more

¹ The well-known exponential curve ($y = \frac{A}{e^{hx^2}}$) which expresses geometrically the law of deviation from the average. Cf. Quetelet, "*Letters on Probabilities*;" Venn, "*Logic of Chance*."

² For explanation of Plate see p. 378.

precise what we mean by the terms "genius," "talent," and the like, may also be utilised to compare the abilities of different nations or races, and I propose to ascertain how many X's, G's, and F's, illustrious, eminent, and distinguished men, there have been per million among those Jews who have reached the age of fifty between 1785 and 1885, and by this means to obtain an estimate of Jewish ability as compared with British. It is right to mention that Mr. Galton is nowadays of opinion that we cannot rely upon the absolute accuracy of his results, owing to the variations at the end of a scale ranged according to the law of error.¹ But while this affects the absolute accuracy of his results it need not render a comparative estimate altogether valueless. If I take a metre rod in my hand, thinking it to be a yard measure, all the measurements I take will be too short by an inch in every foot. But if I wish to know whether one log is twice as long as another my metre rod will serve me as well for this purpose as if I were using the bronze bar that gives the standard yard for all England.

We have first to ascertain how many Jews have reached fifty in the century just past. Two methods suggest themselves. Taking the Jewish population of Europe at intervals of a generation in the years 1880, 1850, 1820, and 1790, it can be estimated that a little over 16,000,000 were living at these various epochs. One-fifteenth of these, or 1,040,000, would be males over fifty, and about half that number would have reached fifty and died in the interval. Or we may calculate the Jewish births between 1735 and 1835 at about 6,400,000, and of these nine-twentieths, 3,160,000, would reach the age of fifty, or almost exactly a million and a half males.² The concurrence of the two methods gives us some confidence in saying that, in the past century a million and a half Jews have reached the age of fifty. If Jewish intellect is equal to the English standard, we should expect to find in dictionaries of biography 1 illustrious Jew, 21 eminent ones, and 350 distinguished men of Jewish blood.

How many can we find? For the purpose of this comparison we must keep rigidly to names which have been considered worthy of insertion by the compilers of biographical dictionaries.

¹ The precariousness of the method consists in—(1) the doubt whether the base is fixed in length and so the classes equally removed: this, however, does not affect the comparison so long as it is kept to one standard; (2) doubt as to the symmetry of the curve: on this some evidence will be offered later on; (3) difficulty of trusting results at the end of a curve where accidental causes tend to disturb the law-abiding quality. Against the last may be urged that such inequalities are apt to disappear when such large numbers as a million are concerned. Appendix II offers an empirical justification for the method.

² It was estimated that the Jewish population in 1735 was 1,300,000, and in 1835 3,500,000. The geometric mean of these was taken as approximately 2,000,000, and a birth-rate of '32 reckoned on this for 100 years.

As Jews live all over Europe it would not be fair to confine ourselves to "Men of the Time," and I have accordingly searched Vapereau for France, De Gubernatis for Italy, and Bornmüller for Germany, though the latter two contain only literary celebrities. For persons distinguished in other careers, and for those Jews who died before dictionaries of contemporary biography came into vogue, I have consulted other compilations of about the same standing. There must be many omissions in looking through such extended lists where the creed is generally not mentioned, but I have, notwithstanding, succeeded in collecting from them 335 names of Jews distinguished in all branches of human activity (see Appendix I).

Not all of these 335 deserve to rank as distinguished in the more technical and restricted sense of the term as used in Mr. Galton's investigations. Of the 425 who in each million of Englishmen obtained a place in the dictionaries, 175, or 41 per cent., were deemed by him unworthy of distinction. I have been even more rigorous with the 335 Jews, and have rejected 50 per cent., leaving only 169 distinguished. Now comes the ticklish task of "placing" these, as it were, in a tripos of all the talents. I think, however, few will quarrel with me if I venture to place in the first rank these four illustrious names:—

BENJAMIN DISRAELI, LORD BEACONSFIELD.

HEINRICH HEINE, the greatest German poet since Goethe, "the wittiest Frenchman since Voltaire," the most potent of the warriors in the intellectual War of Liberation which has freed European thought from its mediæval shackles.

FERDINAND LASSALLE,

"whose genius was such

We scarcely can praise it or blame it too much,"

who, armed with all the culture of his time, became the darling leader of the German working classes, and is still remembered by them as "Messiah Lassalle," who was a jurist and an economist of high rank, an orator of great power, a philosopher and a poet, and who made Socialism a force in European politics. Prince Bismarck has confessed that he learned his Socialism from Lassalle, and it was universally recognised that these two were the most influential men in Germany in 1863, the year in which Lassalle met his death in an ignoble duel at the early age of thirty-eight.¹

FELIX BARTHOLDY-MENDELSSOHN, one of the great musicians

¹ Strictly speaking, Lassalle should not be counted, as he did not reach the age of fifty. But I draw no conclusion from the first class alone, and it is not of much consequence whether we reckon the first two classes as 28 or 29, especially when we have to double them to make them applicable to Western Jews.

of the world, who would deserve this place if only for having re-introduced Bach to us. I might perhaps have included his grandfather, Moses Mendelssohn, as the centenary of his death only occurs in 1886, but I should hesitate to class him as illustrious, and the difficulty of decision is luckily removed by the fact that his birth took place in 1729, six years before the limit of our inquiry.

Here, then, in the first class of intellect, where Jews ought to have been satisfied with one-and-a-half illustrious names, we find no less than four. In the second class, the "senior optimes" of our tripes, I place the following twenty-five:—Berthold Auerbach, Germany's greatest novelist; Theodor Benfey, the greatest philologist in Germany, the home of philology; L. Börne, second only to Heine in the struggle for Freethought; Cremieux, to whom the French nation recently decreed the honour of a national funeral; E. Gans, the leader of the German school of law and history; A. Geiger, the head of the Jewish Reform movement; H. Graetz, the Jewish Macaulay, though I class him a rank lower than his English prototype; L. Halévy, the musician; Sir W. Herschell, the astronomer; Jacobi, the mathematician, after whom the abstruse functions "Jacobians" receive their name; Sir George Jessel, late Master of the Rolls; Eduard Lasker, leader of the German National Liberal Party; Solomon Maimon, whom Mr. S. Hodgson declares to be the greatest German metaphysician since Kant (possibly because Maimon anticipated his own position): he was certainly a philosophical critic of the first rank; Karl Marx, the literary founder of Socialism and "headcentre" of the *International*; Meyerbeer, the musician; Neander, the Christian theologian; Jules Oppert, the greatest living assyriologist after Rawlinson; Sir Francis Cohen Palgrave,¹ the earliest of our scientific historians of England; Rachel, the greatest actress of all time; Ricardo, second only to Adam Smith in his influence on political economy; Jules Simon, the French politician; Steinthal and Lazarus, the twin leaders of modern philosophical philology; Professor Sylvester, co-founder with Professor Cayley of the modern higher algebra; and two Jewish scholars, M. Steinschneider and Leopold Zunz, whose names are less known because they have given up to Judaism what was meant for mankind, but whose erudition is, I am confident, sufficient to place them in the high rank which is here assigned them.² Here, then, in the second class, where we should expect

¹ I should not have reckoned Palgrave, but that Mr. Galton has himself marked him in black type (of G class). "Hereditary Genius."

² Many of these names will be unfamiliar to the reader. But if he reflects how unfamiliar the name of Sir G. Jessel, undoubtedly a second class man, would sound in Germany or France, he will perhaps understand that it is

14 eminent Jews to a million, we find as many as 25 to a million and a half, or 17 per million. In the first two classes, then, we have 29 illustrious and eminent names among a million and a half Jews, where we could only expect 22 or 23 of equal calibre among the same number of Englishmen, so that it might seem that Jews have a quarter more great ones of intellect than Englishmen.

But this flattering conclusion is rudely shattered when we turn to the third class of intellect, where Englishmen show 233 names to 99 Jewish celebrities per million. True I have rejected some 30 more names from this class than Mr. Galton would have done. True that these are just the names which would escape notice in a search through biographical dictionaries. But making all allowance for these sources of omission we could scarcely hope to bring up the number of distinguished Jews to that of distinguished Englishmen, whereas if the conclusion we drew from our comparison of the first two classes were correct we should expect many more also in the class of F's. There seems a discontinuity in the Jewish curve, indicated by the sudden droop in the dotted curve in Class F, which casts doubt on our whole method, and certainly traverses directly the favourable conclusion we were first inclined to draw in favour of Jewish ability. The explanation, however, is tolerably obvious. Hitherto we have assumed that our million Englishmen and our million Jews started on equal terms in the race for fame, but we know of course that this is only true for the third of European Jews who dwell in the West of Europe. The two-thirds of Jews who dwell in Russia and Roumania are heavily handicapped, as were indeed the remainder up to very few years ago. If Russia contributed her proper proportion to the 335 Jews on my list, there would be 200 Russian Jews upon it. Instead of that, there are only eight, four of whom have left their stepmother-country and sought a career out of Russia, and of the remaining four, two had to forswear their faith before gaining a reputation, and of the other two, one, Anton Rubinstein, has gained the world's ear by the cosmopolitan art of music, and the other is of fourth class rank in the Jewish speciality of Hebrew. If Russia had not

possible for some of the German and French celebrities mentioned in the list to be Jessels. For some of them I have the authority of Mr. Galton's book for putting them in the second class, and for the most obscure I could quote parallel (apparent) obscurities from "*Hereditary Genius*," e.g., Gryncæus, Cassini, Mieris, Dussek, Porta, Celsius, who are all rightly enough put in the second class. If it is not exactly true that the world knows nothing of its greatest men, it is certain that it knows nothing of the second class men who prepare the way for the greatest. These remarks apply with still greater force to the list contained in Appendix I, and I have therefore been most rigorous in confining it to the names of those who have been selected by experts in celebrity to be included in the dictionaries of biography.

persecuted her Hebrews, and if Russian Jews are of equal calibre to the rest of their brethren, she might have reckoned on 8 men of the rank of Beaconsfield or Heine, 44 of the capacity of Sir George Jessel or Professor Sylvester, and 278 of ability equal to that of an English judge. Thus we seem to have been unfair in assuming that a million and a half Jews have lived to fifty in the past century: only a little more than half a million can be said to have lived, the rest have but existed and have been out of the running in the race for fame. If we take this into consideration, and compare Englishmen with Western Jews only, the first two classes show nearly three times as many as the same number of Englishmen, and the third class, which seemed so poverty-stricken, shows a quarter more names than half a million Englishmen could show. Even here there is discrepancy, and we still have to account for comparative paucity in the third class. Now this is just the class which is likely to be kept down by moderate persecution such as there has been in Western Europe. It would take Russian rigour to repress a Lassalle or a Beaconsfield, a Cremieux or a Lasker. But much less pressure would be sufficient to bar a would-be *savant* from becoming a Professor or perhaps a *savant* at all. And looking through our list we find plenty of evidence of the effects of such persecution. It must have been observed that three out of our four illustrious ones were only Jews by race, not by creed, and of our 22 G's nine have been baptised, and in all, 37 of our list have become Christians, more than one-tenth. Without prying into motives it is notorious, in cases like those of Beaconsfield, Heine, Börne, Gans, Ricardo, that conversion was adopted as the only means of obtaining the *carrière ouverte*. Of the 37 we find 28 born before 1810 and living their life before the year of freedom 1848, whereas of our list 114 only were born before 1810, 213 afterwards. The converts thus formed a quarter of those flourishing before 1848, and only a twenty-fifth of those afterwards. Similarly in Austria during the days when persecution equal to that of Russia prevailed we have only 5 celebrities born before 1810, no less than four of whom gained fame elsewhere, against 27 born in 1810–50. Another sign of persecution is the migratory habits of able Jews, for, as Mr. Galton has remarked, when a career is open to them able men are the last to leave their country. The Heine family form a typical group. The poet is buried in Père la Chaise; one of his brothers became Ritter von Geldern at Vienna, another was Court Physician at St. Petersburg; his sister married and became Princess della Rocca in Italy; while old Solomon Heine, their uncle, was the only one who remained faithful both to his creed and his country. In all 67 of my list, exactly one-fifth found fame in countries other than that of their birth, England

gaining as many as 30, and France 24 men of ability as a reward for their liberality. We could almost test the amount of persecution by the percentage of each country's loss, Russia coming first with 50 per cent., then Austria with 37, Germany 30, Italy 12, France 2, while England has not lost a single able Jew, but has gained as many as she herself produced.¹ With this evidence of persecution even in Western Europe we can explain the paucity of third class Jews, and may conjecture that but for this we should have nearly as many more third class as we have in the first two, who include a treble share. On the whole, then, with these corrections we may say that there is about twice as much chance of finding a distinguished man among Western Jews as among Englishmen.

Thinking that it would be desirable to apply the same method to another race, I have selected Scotchmen as a likely test of the validity of our method. I went through Irving's "Book of Eminent Scotchmen," and selected out of the 3,000 names those who seemed to me to have reached first and second rank during the past century. I also estimated the number of Scotchmen who reached fifty years in that period, and found this to be 960,000, or almost exactly a million. If their ability were the same as Englishmen, they should have one first class and fourteen second class. Instead of this I calculate that four Scotchmen—Carlyle, Gladstone, Macaulay,² and Scott—had reached first class rank (we might say $4\frac{1}{2}$ if we reckon Byron, who was Scotch on his mother's side), and 20 G's—Sir C. Bell, Sir D. Brewster, Lord Brougham, Burns, Lord Campbell, Erskine, David Forbes, General Gordon, Sir W. Hamilton, Sir James Ivory, Lord Jeffrey, D. Livingstone, Sir Chas. Lyell, J. Clark Maxwell, James Mill, J. S. Mill, H. A. J. Munro, Sir C. Napier, Sir W. Thomson, James Watt. This would give Scotchmen a

¹	Born.	Per cent.	Emigrated.	Immigrated.	Lived.	Per cent.	Per cent. Jewish Population.
Austria ..	32	12	12	4	24	9	14
England ..	30	11	0	30	60	21	.6
France ..	53	19	1	24	75	27	.8
Germany ..	128	47	46	5	87	30	7
Italy ..	24	9	3	2	23	9	.5
Russia..	8	2	4	1	4	1	60
United States..	6	2	1	2	6	2	7

From this it would seem that England, France, and Italy have produced the largest number of Jewish celebrities in proportion to their numbers.

² I reckon Macaulay first class not only on account of his literary productions, though these are too much underrated nowadays, but because of his proved abilities as administrator, orator, and conversationalist.

position superior to that of Jews in general, including those of Russia, but intermediate between Englishmen and Jews of Western Europe.

This result may be checked by an application of our method, which leads to the most startling and curious results of our investigation. In assuming our curve of the distribution of ability to be symmetrical, we have opened the way to estimating the excess of ability by calculating its deficit. There should be as many in each class below the average as above. Now in several special instances this is true for Jews. The curve serves to distribute musical or linguistic ability as well as general ability. If Jews have, as we shall see they have, more musicians and philologists at the top of the scale, they should have more deaf-mutes at the lower end of it; we know they have. And the method cuts both ways. Jews are justly proud of having less criminals than their neighbours. But that would imply that they have less moral enthusiasts at the top of the moral scale, and more proportionally of average morality, or in other words more worldly persons: that does not seem opposed to facts.¹ So too, turning again to general ability, if Englishmen, Scotchmen, and Jews are in this order as regards intellect, they should retain the same order as regards want of intellect. This is so, for while Englishmen have 3,050 per million afflicted with mental disease, Scotchmen have 3,400, and Jews 3,900.² The same numbers ought to give the proportion of eminent men of the first four classes, X-D, among the three races. This result of our method was a surprise to myself, and I was deterred from using it by finding that the United States has the smallest proportion of lunatics among civilised states. But instead of disproving our position we have here a remarkable confirmation of it. For the United States have not produced a single man of the first class, except Washington and perhaps Emerson, in the last century. A further confirmation of this curious fact is to be seen in the parallelism of high ability and high lunacy rate in the Protestant states of Europe as compared with the Catholic.³

¹ Other illustrations may be adduced, which seem to bear out this law in the case of Jews as compared with others. Thus they have the reputation of being both more charitable and more mean than their neighbours; of having more superstitious persons and more sceptics; they certainly have both more rich and more poor. Thus their curves of altruism, of faith and of acquisitiveness, seem to conform to the law.

² I take the lunacy rate of England and Scotland from Oettingen, "Moral-statistik," Anhang Tafel XCIV; that of Jews from those of Prussia in "Zeits. Preuss. Stat.," 1882, p. 190. These numbers rather exceed those contained in the four extreme classes, as is indicated in fig. 2, by placing the boundary line within the fifth class from the bottom.

³ It might seem that all progress is impossible if any increase at the top of the scale is counterbalanced by a deficit on the other hand. But true progress

This is not the only piece of instruction we receive from the comparative lunacy rate of the three races we are comparing. The figures themselves have enabled me to interpolate the numbers in the various classes, and to ascertain with some degree of accuracy the number of men of only average ability among them, as in the table attached to Plate XV. There are, according to Mr. Galton, 256,000 of the mediocre class A among a million Englishmen; I reckon by a process of interpolation that there are only 239,000 among Scotchmen, and 222,000 among Jews. It follows that reckoning from the bottom of the scale the 722,000th Jew is equal in ability to the 739,000th Scotchman and the 756,000th Englishman. Or in other words, if we took a hundred men at hazard from each of the three races, the 72nd Jew, reckoned from the least able, would equal in ability the 74th Scotchman or the 76th Englishman, and would be superior in ability to the 72nd of either of the other two races¹ (fig. 3). Thus we arrive at last at a real comparative estimate of Jewish ability, which we may state roughly in the following way. The average Jew has 4 per cent. more ability than the average Englishman, and 2 per cent. more than the average Scotchman. I do not lay very much stress on the accuracy of this result; a Scotch investigator on the same method would probably invert the order. But I feel some confidence in the method, and consider that by its means we may one day be enabled to judge the relative ability of various nations and races. (See Appendix II.)

However satisfactory this result may be to all concerned, we cannot close the inquiry before ascertaining the comparative distribution of Jewish ability among the different branches of human activity. If Jews got into the reference books only for acting, or for chess-playing, or for proficiency in Hebrew, we could not draw any such conclusions as that just mentioned. We must see in what branches Jews show most ability: we must examine their quality as well as their quantity. But before doing so we may gather up a few collateral results of interest. We have already mentioned and explained the large number of baptised Jews in the list. Equally striking is the comparatively large number of Jewesses, no less than thirteen, figuring there as actresses, writers, or leaders of *salons*. At the beginning of this century almost all the chief *salons* of Berlin were presided over by Jewesses—*e.g.*, Dorothea Mendelssohn-

consists in raising the average, elevating Class A into Class B, from which more at the top of the scale and less at the bottom follow inevitably. We must "shift the origin," as the mathematicians say.

¹ This is an application of Mr. Galton's method of percentiles explained in "Journ. Anthropol. Inst.," vol. xiv.

Schlegel, Rahel van Ense, Henriette Herz. The best known English *salon* of recent date was also attracted round a Jewess, Countess Waldegrave. For their numbers, too, the Sephardic or Spanish Jews make a goodly show with twelve celebrities instead of three, which would be a proper proportion: to them belong the two Disraelis, Basevi the architect of the Fitzwilliam Museum, Cambridge, Sir Moses Montefiore, and David Ricardo. But most striking of all is the large number of men of half-Jewish blood.¹ I have included twenty of these in the list, though all but two, Franzos and Salvador, were brought up as Christians, but they have come under Jewish influence both by heredity and from their relations. It may be of interest to enumerate them: Edwin Booth the actor, H. J. Byron, of "Our Boys" celebrity, F. Delitzsch, G. Ebers, the Egyptologist and novelist, Ludovic Halévy, Paul Heyse, Sir John Herschell, Paul Lindau and his brother, Bernal Osborne, Francis Turner Palgrave the critic, W. Gifford Palgrave the traveller, Prevost-Paradol, Jules Simon, Sir Arthur Sullivan, and Sir H. Drummond Wolff. Altogether 5 per cent. of the whole, and yet mixed marriages are not anything like so numerous as that, and as most of my examples are English I have probably missed a large number abroad. I have not included remoter descent, as we can scarcely term them Jews in any sense of the word. Besides, I could only find five examples, of whom the eminent Sir John Millais is one, though where his Jewish blood came in I am unable to ascertain. The paucity of later generations of Jewish intermixture may be due to difficulties in tracing them, or, as I am inclined to suspect, to the infertility of mixed marriages.

Leaving these subsidiary results, let us turn to the *distribution* of Jewish talent. Here, fortunately, I am still able to compare with Mr. Galton's results, as he gave in his book (p. 8 n) a rough analysis of the specialities of the men of the time in Europe generally, and not alone in England. Reducing these to "permillages" (proportion per thousand celebrities), and doing the same with my own results, I obtain the following table:—

¹ Mr. Grant Allen has already made the same observation. "The list that can be compiled of distinguished persons of half-Jewish blood is something simply extraordinary, especially when one remembers the comparatively small sum-total of such intermarriages" ("Mind," vol. viii, p. 504-5).

	Europeans.	Jews.		Europeans.	Jews.
Actors	21	34	Miscellaneous ..	4	3
Agriculture ..	2	..	Metaphysics ..	2	18
Antiquaries ..	23	26	Musicians ..	11	71
Architects ..	6	6	Natural Science ..	22	25
Artists	40	34	Naval	12	..
Authors	316	223	Philologists ..	13	123
Divines	130	105	[Poets*	20	36]
Engineers	13	9	Political Economy	20	26
Engravers	3	..	Science	51	52
Lawyers	44	40	Sculptors	10	12
Medicals	31	49	Sovereigns	21	..
Merchants	12	43	Statesmen	125	83
Military	56	6	Travellers	25	12

* Already included in Authors.

We cannot assume from this list that all cases where Jews have a higher "permillage" they produce more experts per million in that branch; it merely implies that of those who do obtain distinction a larger proportion obtain it in the particular study. In short, the table gives a comparative estimate of English, or rather European, and Jewish *interest* in particular studies, and thus only indirectly of their respective capacity. With this proviso we may sum up as follows. Jews have no distinction whatever as agriculturists, engravers, sailors, and sovereigns. They are less distinguished than Europeans generally as authors, divines, engineers, soldiers, statesmen, travellers. The two lists are approximately equal in antiquaries, architects, artists, lawyers, natural science, political economy, science, sculptors. Jews seem to have superiority as actors, chess-players, doctors, merchants (chiefly financiers), in metaphysics, music, poetry, and philology. On the whole, these results correspond with the rough inductions of common experience. I should, however, have expected a much larger contingent of lawyers and political economists among Jews than among *les autres*, and I am surprised to find Art so equally represented. I have only one artist on my list who reaches even third class rank, Josef Israels, for of course I do not reckon Sir John Millais on the strength of a few Jewish corpuscles in his veins. Most persons will be equally surprised to observe equality in science, both in what Mr. Galton calls natural science and in science pure and simple, chiefly mathematical. As regards the former, of course Jews have no Darwin. It took England 180 years after Newton before she could produce a Darwin, and as Britishers are five times the number of Jews, even including those of Russia, it would take on the same showing 900 years before they produce

another Spinoza, or, even supposing the double superiority to be true, 450 years would be needed. But in the lower ranks even of biology Jews have done and are doing good work. Bernstein, Cohn, Remak, Rosenthal, and Valentin as physiologists, Cohnheim, Hirsch, Liebreich, Lombroso, and Traube as pathologists, will be recognised by specialists, while F. Cohn is perhaps the third greatest botanist in Germany. But Jews show to more advantage in abstract science, mathematics and astronomy. The history of pure mathematics during this century would show large blanks if the names of Jacobi, Sylvester, Kronecker, and Cremona were removed. In astronomy we have the cluster of the Herschells, the name of Goldschmidt, who discovered fourteen asteroids in the "fifties" and "sixties" when such discoveries were not an everyday occurrence, and W. Meyerbeer, brother of the musician and author of the first great chart of the Moon. Altogether, then, I conclude that Jews take their full share in the scientific work of the day. This result of the table, however, was so contrary to my expectations that I have attempted to check it by other estimates. In Sir John Lubbock's Jubilee speech at York I find eight Jewish names out of the 289 who are mentioned as contributing to the last fifty years of science: this is considerably above their proper proportion, even when including the Russian Jews. Again, in M. de Candolle's book, "*Histoire de Science*," I find 10 Jews holding 16 out of the 824 chairs as foreign members of the scientific academies, which he uses as a test of scientific ability. This is just the right proportion, the Jews of Europe being 7 out of 333 million.

Less surprise will be felt at the subjects in which Jews seem to show superiority. In acting that is better recognised on the Continent than here, and the same may be said of medicine: in Austria one may say *Ubi tres medici duo Judæi*. The Jewish merchants who get into the dictionaries are of course the great financiers. But it is chiefly in music and philology that Jewish superiority is most marked—music sixfold, and in philology there seems to be nine times as much Jewish talent as European. For the former, besides the great names of Mendelssohn, Halévy, Meyerbeer, Rubinstein, already mentioned, we have many lesser lights like Sir Julius Benedict, Sir M. Costa, F. Cowen, Joachim, Pauline Lucca, Moscheles, Sir A. Sullivan. English music, to say the least, would be almost non-existent without these Jewish names. Even more striking is the number of Jewish names distinguished in philology. These are not alone connected with Oriental and Semitic philology like Benfey and Oppert, but they count a goodly number of classical scholars, Bernays, Bernhardt, Lehrs, Friedländer, H. Weil, to whom we may add Freund, the author of the Latin Dictionary, which is the basis

of all those used in England. The names of Lazarus and Steinthal are known wherever the principles of philology are studied. In modern languages, too, Jews have done good work. Sanders has done for German what Littré did for French, and a Jew, the well-known Ollendorf, may claim to have taught languages to the largest number of people by the clumsiest method of teaching.

If we may venture to inquire into the causes of the Jewish superiority established on these somewhat hypothetical grounds, there are various reasons which can be given. We have to take account of their residence in cities, always more conducive to the life intellectual. From this, too, follows their addition to commerce as distinguished from industry, and as the former implies head work, and the latter handicraft, mental capacity must be aided by this fact. The care Jews give to their children's education is well known, and must help. All Jewish boys have hitherto had to learn Hebrew, as well as the vernacular, and this must further mental progress. Dissenters generally seem more intellectual because they have early to think out their differences from the generality. In the case of Jews, persecution, when not too severe, has probably aided in bringing out their best powers: to a high-spirited race, persecution, when there is hope of overcoming it, is a spur to action. The solidarity of Jews and the aid they willingly give to young men of promise assists in developing whatever talent there may be in the community. The happy home-life of Jews, and the practical and undogmatic character of their religion, together with the absence of a priesthood, have contributed to give the *corpus sanum*, and thus the *mens sana*. Jewish reason has never been in fetters, and finally the weaker members of each generation have been weeded out by persecution which tempted or forced them to embrace Christianity, and thus contemporary Jews are the survival of a long process of unnatural selection which has seemingly fitted them excellently for the struggle for intellectual existence.

Turning from these general causes, it would be of interest to discover the reasons for the special ability of Jews in music, mathematics, metaphysics, philology, and finance. The chief cause of the musical pre-eminence of Jews lies, in all probability, in the home character of their religion, which necessarily makes music a part of every Jewish home: this too was the only direction in which their artistic sensibilities could be gratified. Jewish philology is in part due to their frequent change of country, and also to the fact that they have had an additional sacred language besides the vernacular. As regards finance, here the Jews have had their greatness thrust upon them: the

world forced them to become financiers centuries before finance became a power, and must not complain if Jews now profit by their start in financial experience. I am inclined to think that their finance has something to do with their decided leaning for mathematics. Metaphysics, with Jews as with others, is an offshoot of theology, but even here we can trace the influence of their mathematical tendency in the abstract nature of their thought. Altogether the productions of Jewish intellect strike one as being predominantly *abstract*—a result, doubtless, of their long life in cities and exclusion from Nature on the one side, and from the education which lies in handicrafts on the other. We may expect great mathematicians and philosophers from them, but not, I think, great inventors, biologists, or painters, till they have had time to throw off the effects of their long seclusion from Nature.

Finally, it is right that I should conclude with a confession and a warning. The former is perhaps unnecessary, but it is that this paper, which puts Jewish ability in a favourable light, emanates from a Jew. I am afraid this is bad taste, though I might defend myself by the example of the great Swiss naturalist, De Candolle, who has written a large book to show how superior Swiss naturalists are to all others. I should have been glad to hand over the investigation to a Gentile if I could have found one with sufficient interest in Jews to undertake the task, patience sufficient to look through some 30,000 names, and temerity enough to classify all the Jewish talents in their order of merit. Failing this, I have had to risk the imputation of bad taste, and shall be content if I avoid that of bad science. I can only say that I have throughout been conscious of the danger of being biassed in favour of Jews, and have guarded against it to the best of my power, taking a final precaution in warning the reader of the fact. At any rate, I do not think the results I have reached run counter to any common impression, and certainly not, in liberal England, to any popular prejudice.

APPENDIX I.

*Jewish Celebrities, 1785–1885.*¹

CELEBRITY is a relative term. In some cases it may mean that oecumenical fame which M. Renan has declared to be the one thing that is not vanity. In other cases, again, it may only indicate the local notoriety of a prominent member of a clique. There is always

¹ This list appeared first in the *Jewish Chronicle* of 25th September, 1885. M. Isidore Loeb and Professor Kaufmann have been good enough to give me some additions and corrections. Owing to these, the numbers given in the body of the paper no longer exactly answer to the data given in the Appendix, but the changes were too unimportant to need a revision of the numerical results.

the danger of including in any list of Jewish celebrities cases of the latter kind. This is the more probable with living notorieties whose true proportions are obscured by their very proximity to us. On the other hand, Jewish celebrities are scattered over all the lands of civilisation, and any collection made in one of them is too likely to ignore Jews of other countries whose fame may be local, but none the less deserved. Finally, now that the barriers of demarkation are removed, there is often a difficulty of identifying eminent men as Jews, and, still more, the necessity of excluding from our list men credited with being Jews without any warrant.¹

I have endeavoured to avoid these pitfalls by obtaining the following list of Jewish celebrities from the works specially devoted to recording the names of those who stand out from the rest of their countrymen because they have added to the wisdom or delight of the world. Almost without exception I have obtained the names of living Jewish celebrities from the following four works:—

Vapereau, "*Dictionnaire des Contemporains*," Paris, 1880 (7,528 names); T. Cooper, "*Men of the Time*," London, 1880 (3,108 names); A. de Gubernatis, "*Dizionario degli scrittori contemporanei*," Florence, 1879 (4,525 names); Bornmüller, "*Schriftstellerlexikon*," Leipzig, 1882 (2,367 names).²

For Jews of the past I have had resort to Oettinger, "*Moniteur des Dates*," Dresden, 1865–82, but as this includes no less than 167,000 names, I have not gone through it, but merely referred to it for names which I otherwise knew to be well known. In all I have obtained 330 names of Jews born between 1735 and 1835, and celebrated between 1785 and 1885, whom the compilers of these works consider worthy of distinction.³ I have only included those who have come under Jewish influences in their youth.

For reasons explained in the foregoing paper I have endeavoured to class these under various specialities in four different orders of merit. The few "illustrious" Jews are printed in black type, those whom I regard as "eminent" have their names in small capitals; the next grade including "distinguished" Jews have been placed in italics, and the remainder in ordinary type. The names of those who are Jews only in blood and not in creed, have an asterisk affixed to them; those of half-Jewish blood have an

¹ There is scarcely a celebrity of modern times whose name is at all Biblical, or nose not altogether snub, who has not been written down as Jew. Gambetta, Brahms, G. H. Lewes, Adelina Patti, Castelar, are among those I have seen. Even George Eliot could write, "You will be glad to hear that Helmholtz is a Jew." (M. Blind, George Eliot, p. 91.)

² I have obtained a few additional names from Warne's excellent "*Bijou Biography*" and from F. Martin's "*Dict. Cont. Biog.*" On the other hand, I have not accepted the few Jewish names to be found in Drake's "*Dict. American Biog.*," 1871, or Heaton's "*Australian Dict. of Dates*," 1878 (7 out of 924), as their contents did not seem to me up to the level of the other authorities. I felt, however, tempted to add Sir Julius Vogel from the last-named.

³ Servi, "*Gli Israeliti d'Europa*," 1873, has some 218 names, of which only 52 appear in the present list. Morais' "*Eminent Jews of the Nineteenth Century*" contains in the index some 285 names, only 74 of which occur in my list.

obelisk prefixed, which also implies another faith except in the cases of Franzos and Salvador. A single date after a name is that of birth, and implies that the subject is, so far as I can ascertain, still living.

The world delights more to honour those who delight it than those who instruct it, and we may therefore begin with the Protean aspects of

ART.

BELLES LETTRES.—And first among poets we have the great name of **Heinrich Heine*** (1799-1856), whom Matthew Arnold goes so far as to term "the greatest name in European literature since Goethe." Austria boasts of five Jewish poets, *L. A. Frankl*, Ritter von Hochwarth (1810), *K. Beck** (1817), and *S. Heller* (1823), author of "Ahasver," *L. Wihl* (1819), *L. Kalisch* (1814), and France, *E. Manuel* (1823). Italy has *D. Levi* (1821), and *S. Romanelli* (1757-1814), Germany, *M. Beer* (1800-33), author of "Struensee," and brother of the composer, and *S. Lipiner* (1850), who made a sensation a few years back with his "Entfesselte Prometheus," and finally, Denmark had *Henrick Hertz* (1798-1878). The next highest form of literary art at the present day is the novel, "prose-poetry," as the Germans call it. In this branch there occur the great names of *BERTHOLD AUERBACH* (1812-82), and *BENJAMIN DISRAELI* (1804-81), while †*K. E. Franzos* (1848) bids fair to reach equal heights. These are followed by *L. Kompert* (1822) and *A. Bernstein* (1812-83), the latter of whom turned from novel-writing to popularising science. These with *S. Kohn* (1825), the author of "Gabriel," and *M. Goldschmidt* (1819), may be regarded as the specifically Jewish novelists, and specimens of the work of the five foreigners have been translated into English, as well as into most European languages. Judaism may claim half of the brilliant talents of †*Paul Heyse* (1830), and there seems to be some probability that *Jules Verne* (1828) is a Jew. The novel is a branch of literary art in which women attain considerable skill. *Madame Fanny Lewald** (1811), Heine's sister, the *Prinzessa della Rocca** (1810), and the Danish novelist *Olivia Levison* (1847), known as "Sylvia Bennett," are the representative Jewesses. My authorities add the names of *A. Meissner* (1822-85), *Max Ring* (1817), and *A. Schrader* (1815-78). Jewish dramatists may follow Jewish novelists. The two most conspicuous names here are *S. Mosenthal* (1821-77), whose "Leah" traversed the boards of Europe, and †*Ludovic Halévy* (1834), the composer's nephew, and the most prolific of contemporary French dramatists. *J. v. Weilen* (1830) and *Hugo Bürger* (1846) are two of the chief dramatists in Austria. *E. Abraham* (1833), *H. J. Cremieux* (1828), *A. P. A. Millaud* (1836), contribute to the French stage, while *D. Kalisch* (1820-72), *E. Jacobson* (1833), and *S. Schlessinger* (1825) have contributed many comedies to the German stage. The late †*H. J. Byron* (1835-84) was partly of Jewish blood, his mother being a daughter of *Dr. Solomon* who found "Balm in Gilead." We have now to add

litterateurs of the essayist type. Under this head we may place L. BÖRNE (1786-1837), a brave warrior in the literary War of Liberation, G. RIESSER (1806-63), K. BLIND (1833), whose celebrity is more political than literary. A writer of quite a different class was Grace Aguilar (1816-47), whose volumes on "Home Influence" and the like still find favour among Englishwomen. To them we may add literary critics, the chief Jewish name in this branch being that of George Brandes (1842), to whom we may add I. Disraeli (1766-1848), of "Curiosities of Literature" fame, and M. Bernays* (1834).

PRESS.—In the last two rubrics we have almost passed the line which separates *belles lettres* from the press to which we may now turn. The chief reviews of Germany, *Deutsche Rundschau*, *Gegenwart*, *Nord und Süd*, are edited by Julius Rodenburg (1831) and †Paul Lindau (1839) respectively. Other German journalists of Jewish origin are I. Leiderer ("Ichneumon," 1810), O. Gumprecht (1813), musical critic, O. Blumenthal (1805), and M. Saphir (1795-1858), a comic writer of some power. There are besides two colonies of Jewish journalists situated at Vienna and Paris, the centres of *feuilleton* writing. At the former capital Heine's brother, G. Heine (1805), won his title of Ritter von der Geldern, and D. Spitzer (1835), author of *Wiener Spaziergänge*, M. Hartmann (1821), M. Barach ("Dr. Märzroth") (1818), I. Jeitteles* (1814, "Julius Seidlitz"), F. Gross (1849), E. Kuh (1828-76), and I. Nordmann (1820) have earned their meed of praise in commenting on the events of the day. In the Parisian Brotherhood of the Pen we have A. Wolff (1825), in a way the *doyen* of the French Press whose position corresponds with that of G. A. Sala on our own, and A. Weill (1813), whose relations with the press are now in the past. Besides these there are, or were, Leon Halévy (1802-83), the composer's brother and the dramatist's father, †Prevost-Paradol (1829-79), E. Naquet (1819), and M. A. Millaud (1829), both brothers of French Senators, Joseph Cohen (1817), and two Germans located at Paris, Max Nordau (1849) and A. Cohn (1819), the latter a literary Jack of all trades, who is known under the soubriquet of "August Mels." The names of the great Paris publishers, Michel (1821-75) and Calmann Levy (1819), may be added to the list of Parisian journalists. Italy gives us C. Levi (1852), and Denmark had L. L. Nathanson* (1780-1868).¹

MUSIC.—Turning from what we may call the arts of rhyme and reason, we may now enumerate Jewish celebrities in the art of rhythm and melody. F. B. Mendelssohn* (1809-47) stands out foremost here as the *wunderkind* of modern music; apart from the intrinsic merits of his own work he would deserve the world's gratitude for having re-discovered Bach. Some would reckon the

¹ The above names appear in Vapereau, Bornmüller, and De Gubernatis. To many of my readers names of special correspondents like M. de Blowitz, *Times* correspondent at Paris, and the late Dr. Schlesinger, London representative of the *Kölnische Zeitung*, would seem to deserve insertion as well as many of these obscurities.

musical merits of J. E. F. HALÈVY (1799-1862) as even superior to that of Mendelssohn, and J. MEYERREER (1794-1864) had the merit of being Wagner's master in his "first period." *Ignaz Moscheles* (1794-1870) comes, perhaps, next in the list of Jewish composers, though his reputation is much narrower than that of *J. Offenbach** (1819-82), the musical voice of the Second Empire. Our own England offers the promise of even higher things in *F. H. Cowen* (1852). Most of the "titular" musical leaders in this country are reported of Jewish blood, *Sir J. Benedict** (1805-85), *Sir M. Costa** (1810-84), "born in Naples of an old Spanish family" (a Sephardi), and †*Sir A. Sullivan* (1844). Of minor composers we may select of Frenchmen N. M. Alkan (1803-75?), John Cohen (1835), and Em. Jonas (1827); of Englishmen, I. Nathan (1792-1865), to whose music Byron wrote his "Hebrew Melodies," and C. K. Salaman (1814), and I also find a Swede of some note in *J. A. Josephson (1818). But Jews have perhaps achieved greater triumphs as executants than as composers. The piano has found its greatest master at the present day in **Anton Rubinstein* (1829), and **Joseph Joachim* (1831) may be said to play first fiddle wherever he goes. Of great teachers *Felicien David* (1810-73) for the violin, and *Ferdinand Hiller* (1813) for the piano, may be here mentioned. H. Heller (1813), the brothers Herz (1806), and J. S. Herz (1797) are well-known French pianists, and the eccentric H. Cohn* ("Père Hermann") is a violinist of some reputation. The sweetest singers of Israel are *M. Braham* (1774-1856), who used invariably to compose his own songs, among which the "Death of Nelson" has become an English *Volkstied*, and *Pauline Lucca** (1840).

The STAGE owes much of its attractive powers in recent years to Jewish genius. The greatest name among French tragedians is acknowledged to be that of RACHEL FELIX (1820-58), and her only rival in European fame is nowadays *S. Bernhardt** (1844). Other actresses of note on the French stage have been Madame Judith (1827), a relation of Rachel's, and I. Nathalie (1816). Of Jewish actors I find mentioned with honour *L. Barnay* (1842), *A. Sonnenthal* (1834), *L. J. Booth* (1796-1853), and his son †*Edwin Booth*, *B. Davidson* (1818-72), *F. L. F. Loewe* (1816), *D. E. Bandman* (1839), and *E. Blum* (1836). Of great managers mention should be made at least of *B. Lumley* (1812-75).

PAINTING AND SCULPTURE.—Finally we may conclude this list of Jewish contributors to Art by an enumeration of Jewish painters. Sir J. E. Millais has, we understand, Jewish blood in his veins, but we cannot include him among Jewish painters. The first place among these is held by *Josef Israels* (1824), celebrated for his delineations of Dutch fisher-life. Then comes *E. Bendemon* (1811), and *A. Solomon* (1835-72), once well known for his painting, "Waiting for the Verdict"; *S. A. Hart* (1806-81) deserves a place here as the first Jewish Royal Academician; *W. Goodman*. My authorities add the following names:—*J. A. M. Jacobs* (1812), the brothers *C. E. Lehman* (1814) and *R. Lehman* (1819), *E. Levy* (1826) and *H. L. Levy* (1840), *B. Ulmann* (1829), and *J. Worms*

(1832), all in France, and F. E. Meyerheim (1808-79), in Germany. Of sculptors there are two who have attained to some eminence in France, *Adam Solomon* (1818-81) and H. J. Daniel (1804), while E. Wolff (1814) is known in France, and another E. Wolff (1802) in Italy. Only two architects occur in my authorities, *G. Basevi** (1795-1845), Lord Beaconsfield's uncle, and architect of the Fitzwilliam Museum, Cambridge, and A. Hirsch (1828).

II.—SCIENCE.

Turning from art that delights to science that instructs, we may begin by enumerating the few Jewish names who have reached any kind of eminence in PHILOSOPHY. Of these the most *genial*, though not the best known or the most influential, is SOLOMON MAIMON (1753-1800), one of the most remarkable men that Judaism has produced. Though only trained in the ordinary Rabbinic schools, he displayed metaphysical powers of a high order. His genius was recognised by Kant, and though soon obscured and eclipsed by the great Epigonoi, Fichte, Hegel, and Schelling, it is nowadays recognised that his criticism struck at the root of the Kantian system. His remarkable self-analysis in his autobiography would stamp him as no ordinary man; it is the nearest to Rousseau's "Confessions" of all self-revelations. Maimon was also one of the earliest forerunners of Symbolic Logic (*cf.* Venn, "Symbolic Logic," pp. 377, 420). The only other names of importance are those of H. STEINTHAL (1828), *M. Lazarus* (1824), and A. Franck (1809), Membre de l'Institut and editor of a philosophical encyclopædia. The former, however, has gained his greatest laurels in philology, the two latter in literature of an essayist type. Lassalle perhaps deserves mention here for his book on Heracleitus. One of my authorities adds a name unknown to me, Melchior Meyr (1810-71).¹

HISTORY, philosophy teaching by example, has chiefly attracted Jews so far as it affects themselves. Of Jewish historians, H. GRAETZ (1817) is undoubtedly the greatest, and deserves to rank by himself, though his judgment is not as great as his erudition. *J. M. Jost* (1793-1864) comes next to him, and then †*J. Salvador* (1798-1860), who was a potent influence in his way in France. I. De Costa* (1798-1861) also wrote the history of the nation he had deserted. Jews have also written history of other nations, notably Sir F. COHEN PALGRAVE* (1788-1861), the first in point of date of the scientific historians of England. *G. F. Herzberg* (1821), the Greek historian, is, I believe, a Jew, and so were S. Romanin (1808-61), the historian of Venice, and P. Jaffé* (1819-70), who drew up the *Regesta* of the Popes. W. Frankl* (Fraknoi) (1843) is one of the chief historians of Hungarian, and M. Philipson (1846) and H. Breslau (1848) are German historians of promise. Young Prof. L. Geiger (1848) promises to be the leading authority on the Renaissance; H. Cohen (1810) an authority of numismatics. A

¹ Professor H. Cohen, the Kantian, has not yet got into the dictionaries. N. Krochmal (1785-1840), who made a not unsuccessful attempt to combine

few antiquarians may follow the historians. *M. A. Levy* (1817-72), one of the chief authorities on ancient epigraphy, *J. L. Klein* (1810-76) wrote the most voluminous work on the history of the drama; *G. Coen* (1847), an Italian bibliographer, and *Mr. L. B. Phillips* (1842), the compiler of an extensive "Dictionary of Biographical Reference."

ECONOMICS studies the sinews of history, and Jewish economists have been some of the most influential names in the science. *DAVID RICARDO** (1772-1823) is only second to Adam Smith. *KARL MARX* (1808-83) was the "headcentre" of modern Socialism, though this was led socially by the gifted *FERDINAND LASSALLE* (1825-63), who will take even higher rank when we come to politicians. Other Jewish economists are *E. Morpurgo* (1840-85), and *E. Luzzati* (1843). Statistics is the handmaid of Economics, and three Jewish names, *M. Block* (1816), *J. Körösi* (1844), and *L. Levi** (1821), are distinguished in this science.

MATHEMATICS.—Here we reach another speciality of Jews. At their head stands the name of Professor *J. G. SYLVESTER* (1814), probably the greatest living pure mathematician, if his rival and friend, Professor Cayley, does not usurp that place. Of equal rank in the past was *C. G. J. JACOBI** (1804-51), after whom certain intricate functions are termed "Jacobians." Then come *L. Kronecker* (1823) and *L. Cremona* (1830), and these are followed by *H. Filipowski* (1817-72), the compiler of some anti-logarithmic tables, *O. Terquem* (1782-92), *M. Levy* (1791-53), *B. Gompertz* (1779-1865), the first actuary of the "Alliance," and one of the earliest students of "Double Algebra," *L. Bendavid* (1762-1783), *Mendelssohn's* friend, and *I. Blum* (1812).¹

ASTRONOMY has some very great names of Jewish blood, though some of them kept not their Jewish faith. Of these the greatest is *Sir W. HERSCHELL** (1738-1822); and his sister, *C. Herschell** (1750-1848). To these we can add *H. Goldschmidt* (1802-66), the discoverer of 14 asteroids, *W. Meyerbeer*, Meyerbeer's brother, and first cartographer of the moon (1797-1850), and *M. Löwy* (1833), of the Paris Observatory.

BIOLOGY.—Few Jews seem to have devoted themselves to this subject, though *F. Cohn* (1828) and *S. Pringsheim* are among the greatest names in German botany. In the department of physiology, Jews, however, count a large number of comparatively important names. *R. Remak* (1816-65) was one of the greatest in the past, *G. G. Valentin* (1808-83) wrote one of the best text-books in the "fifties," and "Valentin's knife" is still used by specialists. Both *J. Bernstein* (1839) and *J. Rosenthal* (1836) have had books in the "International Scientific Series," and *J. Cohnheim* (1839-84), *H. Cohn* (1838) the oculist, and *G. Schwalbe* (1846) are other Jewish

Ibn Ezra and *Hegel*, will probably always be kept out of them by his choice of Hebrew to express his views.

¹ *G. Cantor*, the historian of mathematics, *T. Reiss*, the physicist, and the first Jew to enter the Berlin Academy, have escaped the notice of the biographers. Professor *Schuster* has only to wait.

names connected with physiology, most of them as specialists on nerves. Other names will meet us among the Jewish doctors.

PHILOLOGY.—But it is chiefly in philology that Jewish science is so predominant. The philosophic side of philology is nowadays dominated by the school of M. LAZARUS (1834) and H. STEINTAL (1828), who have founded the science of national psychology. Carl Abel (1839) is doing good work in treating of Comparative Lexicography, and L. Geiger was even a greater name (1829–70). M. Bréal (1832) is one of the greatest authorities on Comparative Mythology. Classical Philology is not without its Jewish masters, L. Friedländer (1814), the greatest living authority on the silver age of Rome, J. Bernays (1834–82), W. Freund (1806), on whose Latin dictionary all those used in England are founded, H. Weil (1818), Membre de l'Institut, Bernhardt* (1800–75), Lehrs* (1802–78), and L. Meyer (1833). Modern languages have also found their masters among Jews. The gifted A. L. Davids (1811–31) for Turkish, A. Vambéry* (1832), and M. Bloch* (1815) for Hungarian, A. Darmesteter (1846) for French, D. Sanders (1819) for German and modern Greek, M. Landau (1837) for Italian, are here the Jewish names, while H. Bacharach (1810) is mentioned as a translator from German into French, and H. G. Ollendorf (1805–65) invented the method by which modern languages are still chiefly taught. But it is only natural that Jews should take the highest rank in Oriental Philology. In Germany TH. BENFEY* (1809–82) held the same position as Professor Max Müller does in England. His great speciality was Sanscrit, as is that of G. J. Ascoli (1829) and E. Brandes (1847).¹ Coptic is that of C. Abel, Egyptian of G. Ebers* (1837), Hindustani of G. G. Leitner* (1840), and, it seems, all Eastern tongues of Dr. L. Loewe (1809). M. James Darmesteter (1849) is now one of the chief Zend scholars, and promises to be one of the most influential Orientalists in Europe. In the Semitic branches we find even more Jews. Professor J. OPPERT (1825) is perhaps the leading Assyriologist of the day, and has advanced the development of cuneiform more than any living man after Rawlinson. The promise of F. Luzzato (1829–54) in the same branch was cut off by an early death. The late M. A. Levy was an authority on Phœnician (1817–72). In Arabic G. Weil (1808) translated the 1,001 Nights, and wrote the Standard History of the Caliphs. The two Derenbourgs, J. Derenbourg père (1811) and H. Derenbourg fils (1844), S. Munk (1805–66), the Editor of Maimonides, I. Goldziher (1840), (also known for a rather wild book on the mythology of the Hebrews), and D. H. Müller are all well-known Arabists. We naturally meet with a crowd of Jewish names connected with the Hebrew language and literature. Of these the two greatest are undoubtedly LEOPOLD ZUNZ (1794) and MORITZ STEINSCHNEIDER (1816); though A. GEIGER (1810–74) displayed talents of as wide range as they. Graetz we have already mentioned, and S. L. Rapaport (1790–1867), co-founder with Zunz of modern Jewish

¹ I cannot find T. Goldstücker (1819–71) in any of the reference books.

scholarship, *S. D. Luzzato* (1800–65), *Z. Frankel* (1801–75), the chief of scholarly Talmudists, and *longo intervallo J. Fürst* (1805–73), author of a Hebrew Concordance and Lexicon, are the next greatest names. *A. Jellinek* (1821) has never concentrated himself sufficiently to do justice to his powers, and the same may be said of *M. M. Kalisch* (1828–85). I would add the names of my friends *Dr. A. Neubauer* (1832) and *Dr. M. Friedländer* (1833) to the above. The versatile *L. Philippsohn* (1811), *M. Kayserling* (1828), and *D. Castelli* (1836) follow, and these may be succeeded by an alphabetical list of the remainder, *Dr. H. Adler* (1839), the Chief Rabbi, *Dr. N. M. Adler* (1803), *E. Benamozegh* (1822), *F. F. Benary** (1805), *A. Benisch* (1811–78) *J. H. Biesenthal** (1800), *I. Cahen* (1826), *S. Cahen* (1796–1863), *E. Carmoly* (1885–75), *B. Consolo* (1815), *M. Lattes* (1846–84), *I. Leeser* (1806–68), *D. Levi* (1740–99), *M. Mortara* (1815), *M. Margoliouth** (1820–82), *M. Shapiro* (1816), and *M. Soave* (1801–83).¹

III.—PRACTICAL LIFE.

POLITICS.—Considering the restrictions under which they have laboured, Jews have shown marked ability for politics. Here they have two names of the very first rank. **Lord Beaconsfield*** (1804–81), whatever we may think of his political achievement, is certainly entitled to rank among the first ten men of his time in England. **Ferdinand Lassalle** (1825–63), the Messiah of modern Socialism, made the greatest impression of any man of his time in Germany; in 1863, when he died in a duel at the early age of thirty-eight, Bismarck and he were regarded as the two foremost men of the Fatherland.* These great names are followed by those of **JULES SIMON*** (1814), whose Jewish parentage is not certain, **I. A. CREMIEUX** (1796–1881), to whom the French nation awarded a public funeral, and **E. LASKER** (1839–83), the leader of the National Liberal Party in Germany. Other important personages are *A. Fould* (1800–67), *M. Goudchaux* (1727–1862), *G. d'Eichthal** (1804), and *A. Naquet* (1834) in France; *L. Bamberger* (1828) and *J. Jacoby* (1805–77) in Germany, the latter the leading spirit of German Liberalism; and *I. Kuranda* (1811–84) and *E. Horn* (1825–75) in Austria; *T. Massarani* (1826) may follow here, though more distinguished as poet and painter than as politician. *W. Löwe* (1814) and *H. B. Oppenheim* (1819–80) in Germany; *Sir F.*

¹ These are all the names of Hebraists occurring in the books of reference to which I restrict myself. The lacunæ under this head are naturally many. I can find nowhere any mention of *Barasch*, *S. Benedetti*, *A. Berliner*, *D. Chwolson**, *E. Deutsch* (1829–73), *L. Dukes*, *R. Eisel* of *Slonim*, *I. Erter*, *Fassel*, *J. Friedman*, *J. L. Gordon*, *Jos. Halévy*, *Harkavy*, *N. Krochmal* (1785–1820), *L. Löw* (1811–75), *Mappo*, *J. S. Nathanson*, *Reifmann*, *Rosin*, *Schorr*, *Weiss*, not to speak of younger men whose fame is yet to come. On the other hand, *Cooper* inserts *J. Levisohn** (1797), whose only claim to distinction seems to be that a book he wrote was suppressed, and only two copies of it are now said to be in existence.

² A brilliant study of the last year of his life is contained in *George Meredith's* "Tragic Comedians."

Goldsmid (1808-80), Baron *Lionel de Rothschild* (1808-81), Sir *D. Salomons* (1797-1873) and Sir *B. S. Phillips* (1811), in England, and *MM. Millaud* (1834), *F. David* (1796-1879), and *Bédarrides* (1817) in France, complete the list of politicians contained in my authorities. *I. Artom* (1829) may be added as a distinguished diplomatist.

THE PROFESSIONS also yield their quota of Jewish celebrities, though it is extremely seldom that a professional man reaches international rank. *Medicine* has been the favourite among Jews, who count among their number, in addition to those mentioned as physiologists, the names of *Traube* (1818-76), *C. Lombroso* (1836), the greatest of Italian doctors, *F. R. Liebreich* (1830), the ophthalmologist and inventor of the "eye mirror," *A. Hirsch* (1817), the standard authority on "medical geography," *Zeissl* (1812), the chief authority on syphilis, and *K. F. Canstatt* (1807-50), whose "*Vierteljahrschrift*" was the repository of the first German medical work of the time. Less important names are *M. Heine**, brother of the poet (1807), *H. A. Bardeleben* (1819), a distinguished surgeon, *E. Altschul* (1812), a leading homœopathist, *Störk* (1820-75) the laryngoscopist, *M. L. O. Liebreich* (1839), brother of the ophthalmologist and discoverer of "chloralhydrate" with all its dubious uses; *Germain Sée* (1818), and his son *Marc* (1827), *A. Lombroso* (1813), *L. Mandl* (1812-81), *M. Lévi* (1809-72), and *A. Mayer* (1814) in Paris end the list of distinguished Jewish medical men. *Law* follows with the names of *E. Gans** (1798-1839) as one of the chief leaders in the German school of legal theory; Sir *G. Jessel* (1824-83), late Master of the Rolls, as one of the greatest practical lawyers of the age. *J. P. Benjamin* (1811-84) was the chief English barrister of his time, as well as one of the "headcentres" of the Southerners. *J. Glaser** (1831-85) has been recently described in the newspaper obituaries as "Austria's greatest jurist," and *H. Dernburg** (1829) is an important German legist. Other names of Jewish lawyers are *H. F. Jacobson* (1804-68), *T. M. C. Asser* (1838), who recently represented Holland at the Congo Conference, *I. Luzzati* (1847) and *M. Levi-Vita* (1840), two important Italian legists, and *J. Bédarrides* (1804-69), in France; *Lassalle* deserves to be mentioned here again for his "System des erworbenen Rechts." *Military and Naval* celebrities among Jews are only represented by one in each branch: *MASSENA* (1758-1817) on land, if we may accept Lord Beaconsfield's account of him as a Jew whose real name was "Ménasse,"¹ and *U. P. Levy* (1781-1862) was an Admiral in the United States Navy of some note. *The Church* has not been without its Jewish ornaments; the sober *G. A. W. Neander** (1789-1850), whose *Church History* is still authoritative; the brilliant *P. Cassel** (1827), *M. Ballagi**

¹ "Coningsby," IV, xiv. *M. Loeb* informs me that there is nothing more in this identification than a "*jeu de mot*." Much the same may be said of other parts of the same chapter which everybody has read. Everybody has also read *Thackeray's* inimitable parody of it in "*Codlingsby*," with the amusing climax, "The Pope is one of us!"

(Bloch), the leading Protestant theologian in Hungary, Bishop Hellmuth* of Huron (1820), the sole living Bishop of Hebrew blood, and D. Norsa* (1807), are other names. Chess is nowadays a profession, and mostly a Jewish profession; the two chief living names, W. Steinitz (1837) and J. H. Zukertort (1842), being those of Jews, as well as two masters of the past, A. Alexandre (1766-1850) and J. G. Löwenthal (1810-76). Education gives us the names of D. Friedlander (1750-1834) and Levi-Alvares (1794-1870).

COMMERCE AND PHILANTHROPY have been usually combined among Jewish celebrities. This is certainly the case with S. Heine (1766-1844), the Rothschilds, Meyer (1743-1812), Lionel (1808-81), Edmond (1826), and James (1844-84), Sir M. Montefiore* (1784-1885); the Pereires, Edmond (1800-75), and James (1806-80), L. R. Bischoffsheim (1800-84), J. Mires (1809-71), and J. Truro (1775-1854). These all obtained fortunes in finance. Of great masters of industry there is only one important name, that of B. H. Strousberg* (1828-84), the "Railway King" of Germany; the only other name is that of J. Alexandre (1804-76), a pianoforte manufacturer.

SALONS of importance have been presided over by brilliant Jewesses. The three chief centres of cultured life at Berlin at the beginning of this century were the salons of Rahel von Ense (1771-1833), Dorothea Mendelssohn-Schlegel* (1769-1839), and Henriette Herz (1764-1847).¹

TRAVEL may conclude our new list with the names of Joseph Wolff* (1795-62), the eccentric; †W. G. Palgrave (1826), who opened up Central Arabia; A. Vambéry* (1832), the leading authority on Central Asia; †Sir F. H. Goldsmid, the Persian traveller; G. Oppert (1836); and N. Davis* (1812-82), the explorer of Carthage, if he were a Jew.

The above list does not claim or aim to be exhaustive. It only professes to contain the names of such Jews as have found their way into dictionaries of general biography. By restricting myself thus I have been obliged to insert many names whom I should not myself have thought worthy of mention, and to omit others who appear to me to have been undeservedly overlooked. I have given a few of the latter in footnotes, but have not referred to the many young men of promise now springing up, as my comparison is mainly limited to those over fifty, at which age men first obtain admission to the rolls of fame. On the whole, I do not find many important omissions; even those of the third class rarely fail to attract the attention of the experts in celebrity. I have been obliged to restrict myself in this way as the immediate object of the compilation has been to find materials for discussing the much vexed question as to the relative ability of Jews. To compare them with others we must take the same sources as those from which the names of celebrities generally are taken. For the same purpose it

¹ One of the most important English salons was that of Countess Waldegrave, Braham's daughter, while the gifted family of Raffalovitch holds one of the chief salons in Paris at the present day (*Times*, Sept. 15, 1885).

has been necessary for me to undertake the invidious task of classing the names in four classes corresponding to the four highest classes fixed with mathematical accuracy by Mr. Galton in his "Hereditary Genius," 1869 (p. 34). The fourth class cannot be complete, many names coming by accident into the dictionaries. For purposes of comparison the names only of those in black letters, capitals, or italics are to be considered, though the remainder are useful as means of judging the subjects of Jewish pre-eminence. Even the third class are reckoned by Mr. Galton to reach the average of an English judge of the best times of the Bench, and every one of the Jewish celebrities are far indeed above the average of those men who gain the ordinary prizes of life.

APPENDIX II.

Illustrious Europeans (1785-1885).

I have made the following estimate of the ability of the chief civilised nations founded on the number of first class men they have produced during the century 1785-1885, as compared with the number of males who have reached fifty during that period. The results are of course precarious owing to the difficulty of deciding upon the names of first class men. But they agree sufficiently with popular impressions to deserve record. The validity of the results would be much increased if we could obtain lists of the second class men.

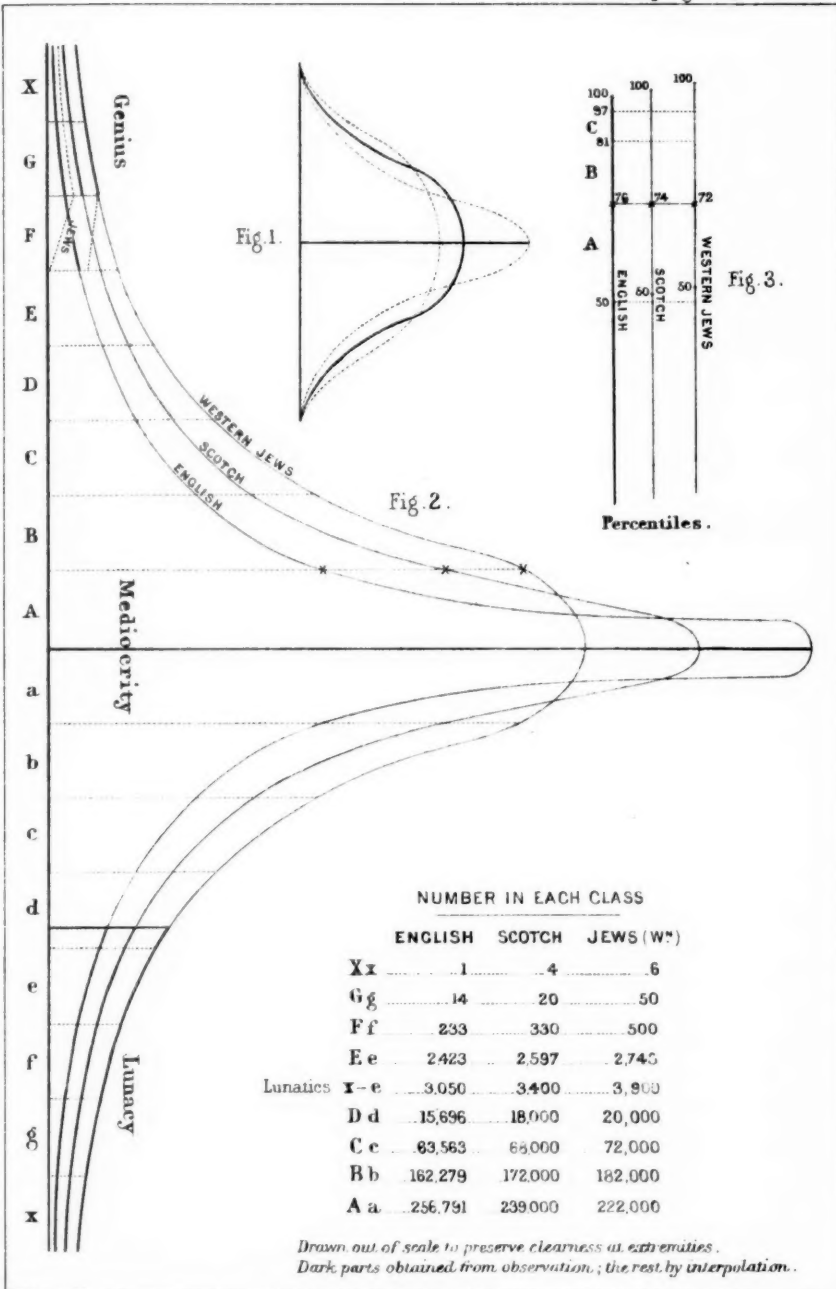
The third column of figures give the relative order of ability of the different nationalities. The discrepancy between the table of the general ability of the different countries, and that in the note on page 359, giving that of the Jewish ability in the same, indicates the influence of the social environment in making talent "kinetic" instead of "potential." The English names and numbers may be taken as confirming Mr. Galton's estimate of one genius per million males over fifty. At first sight there seem to be nearly double that number. But G. Eliot was a woman, Pitt and Byron never reached fifty, Bentham and Faraday are doubtful (though this is counterbalanced by the claims of Shelley and Turner), and Darwin is a man of many millions. So that there have been but 12 certain geniuses among 10 or 11 millions over fifty. I would also call attention to the remarkable groupings of the births of the Englishmen: three clustered around the date 1770 (Wellington 1769, Wordsworth 1770, Scott 1771), five round 1810 (Darwin, Gladstone, and Tennyson all 1809, Thackeray 1811, Dickens 1812), and three round 1820 (Ruskin 1819, Eliot and Spencer 1820). Judging from the middle cluster, it would seem that a nation gives birth to its greatest men when in the throes of its severest struggles. There is, as it were, an incarnation of the *Zeitgeist*. It would be interesting to see if the next batch of European genius has any similar relation to the year 1848.

Nation.	No. of million males reached fifty 1785-1885.	No. of first class men.	No. per million.	Names.
Austria ..	11	2	·2	Kossuth (?), Mozart.
England ..	10	18	1·8	Beaconsfield, Bentham (?), Byron, Carlyle, Dar- win, Dickens, <i>G. Eliot</i> , Faraday (?), Gladstone, Macaulay, Pitt, Ruskin, Scott, Spencer, Tenny- son, Thackeray, Words- worth.
France ..	12	12	1	Comte, Dumas <i>père</i> (?), Gambetta, V. Hugo, Laplace, Lesseps (?), Mirabeau, Napoleon, Pasteur, Renan, Robes- pierre, <i>G. Sand</i> , Thiers.
Germany ..	10	19	1·9	Beethoven, Bismarck, Fichte, Gauss, Goethe, Grimm, Hegel, Heine, Helmholtz, Lassalle, Mendelssohn, Moltke, Mommesen, Schiller, Schopenhauer, Schu- bert, Stein, Wagner.
Italy	7	3	·4	Garibaldi, Leopardi (?), Mazzini.
Russia ..	23	2	·1	Skobelev (?), Turgenief.
United States	8	2	·3	Emerson (?), Washing- ton (?).
All	81	57	·7	

Explanation of Plate XV.

Fig. 1 is only intended to illustrate the fact that closed curves on the same side of the same base, and containing the same area, must cross one another. This principle applied to the curves in fig. 2 enables us to say that if there are more Scotchmen and Jews in the extreme classes, there must be less of them in the middle or mediocre class.

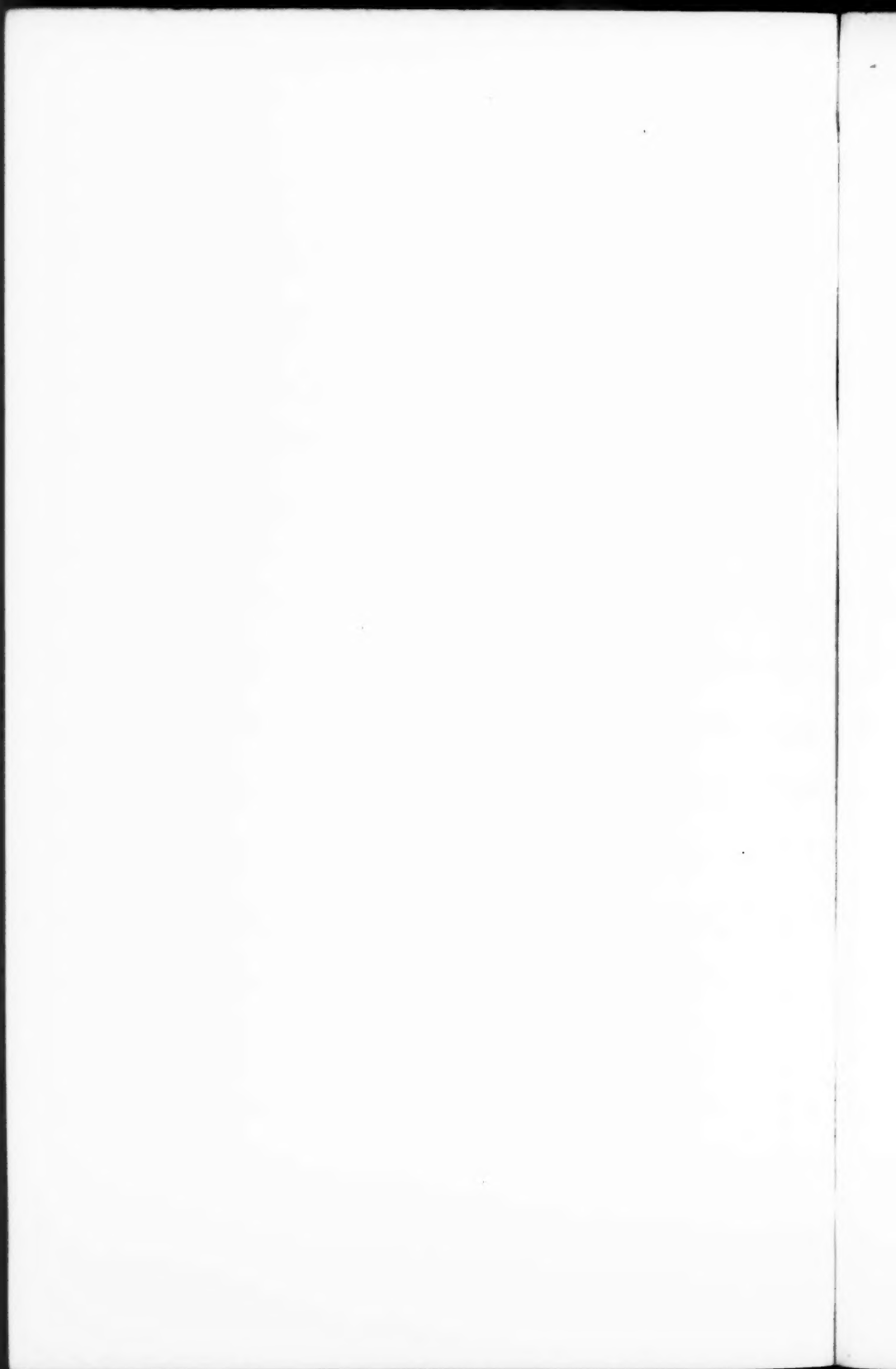
Fig. 2 gives, as it were, the shape of the boundary walls of a million Englishmen, Scotchmen, and Jews penned into sixteen classes, ranging regularly in order of ability. The horizontal dotted lines give the different classes, named symmetrically from the centre line *A, B, C*, &c., towards one end, *a, b, c* towards the other. It is assumed that a class indicated by a small letter is of the same size as that represented by a large letter. The numbers



J. Farago, del.

J.P. & W.R. Emble, lith.

DISTRIBUTION OF ABILITY AMONG **ENGLISHMEN, SCOTCHMEN & JEWS**



in each class in the three races are given in the Table. The English numbers in this are from Mr. Galton's book; the Scotch and Jewish numbers have been calculated from—(1) the number of celebrities; (2) the number of lunatics; (3) the principle illustrated by fig. 1, that the curves must cross.

Fig. 3 is merely an illustration of the statement on page 361, the crosses marking the percentiles shown to be equal by the same crosses in fig. 2. Properly speaking, the Jewish and Scotch percentile bars ought to be elastic and extend equally on both sides of the English fiftieth percentile. A more accurate representation of the relative ability of each percentile among the three races would be to draw the "ogives" for each so that the ordinates corresponding to the 72nd, 74th, 76th percentile respectively should be equal. This would enable us to determine the relative ability of each percentile. But it would be misleading to attempt such accuracy at present, and the more popular statement of the text may serve as a rough indication in the meanwhile.

ANTHROPOLOGICAL MISCELLANEA.

The SCOPE of ANTHROPOLOGY, and its RELATION to the SCIENCE of MIND.

By ALEXANDER BAIN, LL.D.,

Emeritus Professor of Logic, Aberdeen.¹

THE science termed Anthropology, in its literal rendering "Man-Science," cannot be called new. But the derivation of a Greek name teaches nothing. Man, as the most complex thing in nature, has many aspects, and gives birth to many sciences, and we may not yet have exhausted these. It is the case that, within a few years, a mode of approaching the study of mankind, having certain claims to novelty, has been originated, and been made the basis of a specific treatment, and of societies for conducting that treatment, the present section of the British Association being one.

So recent, however, is the origin of this science, that its precise compass is by no means clearly settled. At all events, I think I can discover some vacillation and incoherence in its details, and especially in the relationship between it and the previously existing sciences of man.

Let me first quote the definition of the subject by the leading authority. According to Professor Huxley, it deals with the whole structure, history, and development of man. Still more specific is the enumeration of its parts, in the article devoted to it, in the *Encyclopædia Britannica*, also by a great authority. These are six, viz. :—I. Man's Place in Nature, that is, his relation or standing in the animal kingdom, as a whole; II. His Origin, whether from one pair or otherwise; III. The Classification of the Races, with the delineation of their several characteristics; IV. The Antiquity of Man, which is necessarily connected with his mode of origin, although susceptible of a separate treatment; V. Language, as essentially bound up in the intellectual advancement of mankind; VI. The Development of Civilisation as a whole.

Now it needs a little reflection to discover what brought these six topics together under a new designation. The topics themselves are not all new; most of them are very old, as well as being provided with understood positions in the framework of our knowledge. The greatest novelty attaches to the antiquity of man. Next is man's place in Nature, which has received a distinctive

¹ A Paper read in the Anthropological Section of the British Association at the Aberdeen Meeting, 1885.

treatment of late years. Allied to this is the question of man's origin; while the three remaining subjects, races, language, and civilisation, are neither new nor unplaced in the cycle of the sciences. These last have usually been discussed in total separation. Language stands entirely by itself, and although necessarily connected with the races, on the one hand, and with the totality of civilisation, on the other, gains nothing by being included in the same book, or in the same society, with these two great departments. Language was in the programme of the British Association long before Anthropology was taken up.

I believe that if the six subjects named were regarded merely as satisfying rational curiosity, and as containing applications to our common utilities, like Chemistry or Human Physiology, they would never have been grouped into the present bundle. The reason must lie deeper. It was very soon obvious that the three most recent of the six departments—Man's Place in Nature, Antiquity of Man, and Origin of Man—had bearings of an altogether transcendent kind. They were seen to relate to the everlasting mysteries of the universe—the Whence, the How, and the Whither of this earth, and its inhabitants, ourselves included: offering alternative and rival solutions to those already in the field. The discussion of man's place in nature has laid before us the view that he is, after all, merely the highest type of the zoological series. The inquiry into his antiquity points back to tens of thousands of years; his origin is transferred from one pair to something entirely different, although not precisely stateable. In order to assist in giving validity to these innovating suppositions, and to contribute other modifications of the traditional creeds, the three remaining sciences, Races, Language, and Civilisation, have been called in. The study of the races is so conducted as to militate against the commencement from one pair. The growth of languages is invoked to show the need of a great extension of the time hitherto allotted to the duration of man on the earth; the history of civilisation is turned to account, as showing the human origin of all our institutions, and especially the greatest of them, Religion. Instead of our own creed, the creed of Christendom, being an exclusive revelation, we are now told to face the alternative solutions—that the religions of mankind are either all equally Divine or all equally human: both views having their representatives.

It is quite true that the British Association carefully and rightly abstains from debating those issues; yet we cannot blink the fact that they alone have afforded a basis of union to the present section. If the subjects were to be viewed in a perfectly cold and diletanti fashion, they would be very differently distributed. An Anthropology section unconnected with the highest questions would be made up of a very different aggregate: it would leave out some of these, and take in others. Civilisation, for example, is only a part of the vast science of Sociology, which should have a section or sub-section to itself, and include among other things the theory of government. Psychology, as the parent

science of the human mind, would have to be directly and distinctly named, and not left to random allusions.

The vacillation observable in the bringing up of the several topics, in the several sections of the Association, confirms the position now stated. The Antiquity of Man is well placed in the Geological section, and has often been considered there; indeed, the strongest evidences of all are of a geological character. The place of man in nature is a problem of Zoology, and could be easily kept to that section. The Races of Man at present existing could come under Geography; and everything relating to them, customs, usages, language, creeds, would all be accepted in that section. The former races would belong to History, but there is no Historical section, and so that topic is not fully provided for.

Another vacillation is seen in the double placing of the valuable statistics of measurement of human attributes, bodily and mental, so ably carried out by the president of the section, along with some other energetic observers. This is a recognised topic of Anthropology, but it has also been reported on to the section of Economical Science and Statistics; no doubt with a view to its practical bearings on education and otherwise.

Thus, then, while Geology and Zoology have handed over to us here the burning and boiling questions that appertain to themselves, Geography, the mildest of sections, rising to a sensational heat only by the presence of a Livingstone—if any one were to bring before it a new missing link—would remit the perilous honour to our section.

I must now narrow the ground as fast as possible to come to the points of my paper: the necessary references to the science of mind, in the carrying out of the various anthropological inquiries.

In 1875 the Anthropological Institute of London requested Mr. Herbert Spencer to map out the Comparative Psychology of Man, with a view to provide some sort of method in handling the various questions that came before the Institute. The desire was natural and just. Where so much depends on the varieties of human character, some plan of recording those varieties is needed.

Now to formulate a scheme of human character is not an easy matter. It requires a very consummate acquaintance with the human mind to begin with, and also a considerable amount of study of the mental peculiarities of the inferior animals. In fact, for the objects of Anthropology, man and the animals must be viewed in a line—not, indeed, so as to beg the question in dispute, as to the nature of the barrier that divides them—but for the better showing of agreements and differences, with a view to facilitate the discussion of that barrier.

Mr. Spencer, in obedience to the request of the Institute, drew up a provisional Scheme of Character, and I do not intend, at present, either to re-model or to criticise that scheme. I remark, however, that it pre-supposes a careful analysis of the mind, an indication of the fundamental attributes of our mental nature, physical, intellectual, and moral, and some mode of estimating the degree or amount of these several attributes. The problem of

measurement comes up as indispensable to precision in stretching the plan of character.

An example of the questions that crop out in reviewing the development of mankind is the relative preponderance of the Senses and the Intelligence. It is a peculiarity of many of the lower races to have preternatural acuteness of the special senses—sight, hearing, smell—which, however, would seem to obstruct, instead of aiding, the higher functions of the intellect; for example, the reasoning powers. Yet intellect is grounded upon sense: our thoughts are furnished by the things that we see, hear, touch, smell, taste; and the better provided we are with sensations, the more intelligent must we be. There is here a seeming contradiction, or paradox, of the human constitution, which needs to be reconciled by a deeper view of the mental processes. In fact, it needs a delicate line to be drawn between two modes of sensibility—one contributing to intellectual growth, the other interfering with it. We shall soon see the bearing of this.

I recur to the all-important topic of Measurement, to which the remainder of the paper will be directed. Your section has amply acknowledged the necessity of a mathematics of man, as a prelude to accurate discussion of your questions. You have a standing committee for conducting the operations, under your energetic president. You begin properly with physical characters, and build up a statistics of our own countrymen in the various points of stature, weight, breathing capacity, strength of arm, and the correspondence of these with age and sex.

It is an error to suppose that mental qualities do not admit of measurement. No doubt the highly complex feelings of the mind are incapable of being stated with numerical precisions; yet by a proper mode of approaching the subject, a very considerable degree of accuracy is attainable. We must, however, begin at the beginning, and that beginning is sensation, or the quality of the several senses, especially the higher senses of sight and hearing. A distinction needs to be drawn between the two susceptibilities of any sense—the susceptibility to pain and pleasure, and the delicacy of discrimination of different degrees in shades of impression. These two attributes play a very different part in animal life, and the one is not a key to the other. Each is to be measured in its own way: pleasure and pain, by the expression and the direction of the will; degree of impression by such indication as the subject of the experiment can afford.

Take the case of Sight. Your section has led up admirably to this subject. Beginning with the practical question of colour-blindness, for which perfect tests have been devised, Mr. Roberts has prepared a scale of colours and shades of colour to test the delicacy of individuals to show colour—a most important determination to show the kind of aptitude of each person for special vocations; and, indeed, entering into the final direction of the intellectual powers. For human beings, this determination is particularly easy; it is not so easy for the animals, who can make

no proper sign, but it is of equal importance in the gauging of their capabilities, both sensible and intellectual.

It is probable that the pleasure of colour and the discrimination of colour go together, although not in exact degree. A high predominance of the two conjoined aptitudes foreshadows a mind of artistic capability, and a strong preference of the concrete to the abstract.

The optical or colour discrimination of the eye is one thing, the discrimination of visible form and magnitude is a different thing. This may be assumed to be the most delicate susceptibility of the human mind. We have not contrived measures of it, so as to distinguish the aptitudes of different persons, and follow out the intellectual consequences of unequal endowment. The Report of your Anthropometric Committee given in at the meeting in 1881 approaches this subject in one form, namely, the perception of test-dots placed at different distances from the eye, and the relation of this perception to age—an important determination for those that have to keep a look-out for signals or distant appearances. But a still more advanced class of experiments is needed to ascertain degrees of retinal delicacy in regard to visible form and magnitude; the avocation of a line-engraver being one that would show the faculty at its utmost stretch.

We want, for the purposes of mental science generally, a set of observations on the *plurality* of the sense of vision, or the number of things that can be simultaneously apprehended, and also the relative delicacy of the impressions on the different parts of field of view, from the centre to the circumference. This inquiry has not yet been prosecuted to its full length for even a single individual, still less can differences in character be expressed; although it would not be difficult to surmise the intellectual bearings of such differences. The problem of the source of our perception of space must centre in this property of vision, as being the ultimate source of our cognition of the absolutely simultaneous, as distinguished from rapid succession or transition, which also makes a part of our notion of co-existing things.

All these determinations are pre-eminently suitable to observation and experiment, and may be given with numerical precision. And in so far as they can be accurately made, the facts of intelligence properly so called can be brought under measurement, instead of being left to the ordinary vague and loose phraseology. The compass of the native susceptibilities of the eye, as regards colour, visible form and magnitude, and simultaneous grasp—is the groundwork of the enormous range and complexity of our acquisitions of sight; such as local memories, memories of persons, and of all the innumerable details of our ordinary experience of the world.

One of the most vital determinations, regarding the intellect, is the relation of memory or retentiveness to the delicacy of the sense concerned. There can be no doubt that we remember best the impressions of our most delicate senses, as sight and hearing. But whether the law that connects the two properties be a simple ratio, or not, only experiment can tell.

This matter, however, needs a still farther advance in the observation of mental facts, namely, the measure of the retentive quality of the intellect, as commonly expressed by memory. Now, this is also a subject well suited to experiment, and a beginning has actually been made in it. The relation of our memory or recollection of a fact to the number of repetitions, and to all other circumstances bearing on the retentive power, has been subjected to numerical determination, and may be pushed to an indefinite degree of accuracy. Such researches are pre-eminently within the scope of this section, being the legitimate following up of *Anthropometry* to some of its most fertile applications, and having a decided although remote bearing on the solution of the vast problems that first gave form to the section.

The observations now made on measurements of our various sight-sensibilities might be paralleled in the sense of hearing, which is singularly open to experiment, with definite results. The musical sensibility, depending on the discrimination of pitch, can be estimated with exactness. You merely test the intervals that the person can distinguish, the fractions of a note, or, it may be, the number of notes that bring out the sense of difference. When you find an individual that cannot distinguish between one pitch and another until the interval amounts to two notes in the scale, as I have actually seen on a trial, you of course pronounce that individual totally incapacitated for music. You can also by the same test ascertain if a child has the degree of natural discrimination that justifies you in setting it to learn the art.

Other qualities of hearing can be measured likewise, by suitable means. As regards articulation, the differences of vowel sounds are very unequally felt, and can be put to an exact test; the bearing on character being still more important. An ear for articulation must enter into the aptitude for picking up languages by the ear, and for the language memory generally.

Farther, the cadence of the voice, which is turned to account in elocution, is equally open to discriminative estimate, and the consequences are of an analogous kind, as regards the endowment of oratorical or declamatory speech.

I will advert to only one other region of sensibility, namely, the muscular, that is, the graduation of degrees of energy, as required for manual dexterity of all kinds. This can be reduced to exact measurement, and was included among the now classical experiments of Weber, on Touch, which paved the way for the subsequent labours of German physiologists on the senses.

I mentioned the possibility of approaching the deeper intellectual powers by experiments on the degree of retentiveness of individual minds. There is another attribute of co-equal importance, and the groundwork of the higher powers of reasoning and imagination, that is, the discovery of agreement in the midst of diversity. The point is not to show that a human being or an animal can recognise an object, as a face, on repetition, but can recognise it under some amount of diversity of accompanying circumstances. An animal

needs to be pretty high in the scale of intelligence to identify the portrait of its master. A series of experiments could be devised to show how far this recognition under difficulty can be carried. The hound of Ulysses is said to have recognised his master, purposely disguised as he was, in addition to the changes in his face in twenty years; while the old nurse hesitated till she saw the scar on his knee.

These observations are the same in kind for animals and for men; and the two series of researches confirm each other. The most profitable of all modes of studying animals is to test the number and acuteness of their sensibility. This is the natural commencement and formation of all precise knowledge, and the first key to the difficulties arising from their anomalous endowments. Sir John Lubbock has taken pains to ascertain the sensibility of sight, hearing, and smell, in the ants and bees, and Mr. Darwin made a point of testing the sense endowments of the earthworm. When we have laid a firm basis in the department of the senses, we can proceed to infer important consequences as regards intellectual power, and divine the bearings on the more inscrutable instincts. No animal can work beyond its powers of discrimination; its selection of one of several courses to pursue requires it to feel the difference between them.

The mode of research grounded on discriminative sensibility, and working up from that according to the best known principles of our intellectual nature, may be contrasted with another mode, which has always been in vogue, namely, finding out and noting any surprising feats that animals can perform, out of all proportion to what we should be led to expect of them. The spirit of such inquiries is rather to defy explanation than to promote it; they delight to nonplus and puzzle the scientific investigator, who is working his way upward by slow steps to the higher mysteries. Before accounting for the exceptional gifts of animals—the geniuses of a tribe—we should be able to probe the average and recurring capabilities. Among the indefatigable experimental labours of Sir John Lubbock was an attempt to teach a dog to read, by making him select cards with writing upon them, to convey his wants. Now, this was a real and genuine experiment, if properly interpreted. The question raised was the dog's power of visual discrimination, as tested by his marking the difference between the different inscriptions on the cards. If the distinction of the words passed his faculty of visual perception of form, the operation was hopeless; if within his visual powers, it became a question of inducing his attention by sufficient motives, and this also revealed a point of character bearing on the docility of animals. Sir John no doubt kept within the bounds of humane treatment; but we know that this difficulty in animal training is too often surmounted by persistent cruelty. The truth is, however, that the ordinary experimenter on the powers of animals of acquisition has been long outdone by the professional exhibitor of their wonderful feats. A canary in Edinburgh offered to read my fortune for a penny. Of course I knew

that the animal was a charlatan, but even to educate it up to this point was no small effort. One of the finest similes in our literature is Dekker's "untamable as flies," but it has been falsified by the perseverance of trainers. Not to quote from recorded examples of the teaching of the common fly, the flea, which I suppose is in a lower place in the intellectual scale, was long exhibited in London as a performer of industrial avocations.

My closing observation relates to the present position of the science of Mind, commonly called Psychology, in the programme of the British Association. Taken as a whole, it is nowhere; it would not properly come into any section. Taken in snatches, it appears in several places; it would come in under Zoology, which embraces all that relates to animals; under Physiology, in connection with the nervous system and the senses; and it figures still more largely, although in an altogether subordinate and scarcely acknowledged fashion, in the section on Anthropology. Indeed, to exclude it from this section would be impossible; man is nothing without his mind.

Now while Zoology and Physiology would keep the study of mind within narrow limits, there is no such narrowness in the present section. In the ample bosom of Anthropology, any really valuable contribution to the science of mind should have a natural place. The subject only needs to be openly named and avowed, instead of coming in by side doors, and indirect approaches.

In saying this much, however, I am quite ready to make allowance for a difficulty. The science of mind, taken in all its compass, raises a number of controversies, which might be well enough in a separate society, but would be very unsuited to the sectional discussions of this Association. The perception of a material world, the origin of our ideas, the mystical union of mind and body, free will, a moral sense—are points that I should exclude from the topics of Anthropology, wide as that department is; and the more so, that it has already on its hands the consideration of matters whose importance depends upon their bearing on far more burning controversies than any of these.

Psychology, however, has now a very large area of neutral information; it possesses materials gathered by the same methods of rigorous observation and induction that are followed in the other sciences. The researches of this section exemplify some of these, as I have endeavoured to point out. If these researches are persisted in, they will go still farther into the heart of Psychology as a science; and the true course will be to welcome all the new experiments for determining mental facts with precision, and to treat Psychology, with the limitations I have named, as an acknowledged member of the section. To this subdivision would then be brought the researches into the brain and nerves that deal with mental function; the experiments on the senses having reference to our sensations; the whole of the present mathematics of man, bodily and mental; the still more advanced inquiries relating to our intelligence; and the nature of emotion, as illustrated by expression, in

the manner of Darwin's famous treatise. Indeed, if you were to admit such a paper as that contributed by Mr. Spencer to the Anthropological Institute, you would commit yourselves to a much farther raid on the ground of Psychology than is implied in such an enumeration as the foregoing.

ANTHROPOLOGY IN 1885.

"In that department of biology which deals with man there has been a good deal of progress during the year. One of the most noteworthy events was Mr. F. Galton's address as President of the Anthropological Section at Aberdeen, in which he summed up the results obtained from the large collection of family records which he was able to make. The same ingenious inquirer's conclusions from the data collected at the International Exhibitions from anthropometric measurements also deserve mention as an important contribution to a science of human character and human action. More striking still are the results of the investigations made by the Rev. Malling Hansen, Principal of the Danish Institution for the Deaf and Dumb, into the laws which govern the growth of the human body during childhood, to which attention was called for the first time in *The Times* of yesterday. Professor Flower's attempt, in his Presidential Address at the Anthropological Institute, to lay down some definite principles for the classification of the human species was much needed, and must have been welcome to anthropologists generally. This Institute has during the past year done an unusual amount of good work under the presidency of Mr. Galton. The papers and subsequent discussion on Jewish ethnology, for example, were of very great interest, as well as, to many, of much novelty. In connection with the many geographical and military expeditions of the past year, our knowledge of outlying peoples has made much progress; while anthropological methods are becoming more and more precise. M. de Mortillet's attempt to establish the existence of man or a precursor of man during the Tertiary period, though perhaps not conclusive, is certainly in the direction favoured by anthropologists of reputation."—*The Times*, January 8, 1886.
